



# **STIC Search Report**

## **EIC 1700**

**STIC Database Tracking Number: 189786**

**TO: Ben Sackey**  
**Location: REM 5B31**  
**Art Unit : 1626**  
**May 22, 2006**

**Case Serial Number: 10/731702**

**From: Ross Shipe**  
**Location: EIC 1700**  
**REMSSEN 4B31**  
**Phone: 571/272-6018**  
**Ross.Shipe@uspto.gov**

### **Search Notes**

Examiner Sackey:

Please review the attached search results.

If you have any questions or if you would like to refine the search query, please feel free to contact me at any time.

Thanks you for using EIC 1700 search services!

Ross Shipe (ASRC)  
Technical Information Specialist

ims Fuller

Access DB# 189786

# SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: BEN SACKETY Examiner #: 73489 Date: 5/8/06  
Art. Unit: 162C Phone Number 302-0704 Serial Number: 101731702  
Mail Box and Bldg/Room Location: 6m 5 B 31 Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

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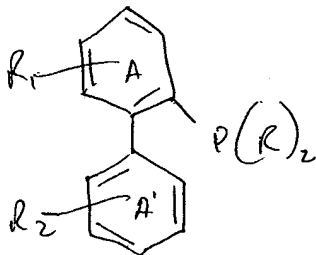
Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: Ligands for metals & improved metal-catalyzed processes base

Inventors (please provide full names):

Earliest Priority Filing Date:

\*For Sequence Searches Only\* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.



R is alkyl, cycloalkyl, aryl, heteroaryl, allyl, heteroalkyl,  $(CH_2)_m-R_{80}$ , and R<sub>2</sub> represent alkyl, cycloalkyl, heterocycloalkyl etc.

A and A' may or may not be substituted.

marks

## STAFF USE ONLY

	Type of Search	Vendors and cost where applicable
Searcher: <u>ROS</u>	NA Sequence (#) _____	STN _____
Searcher Phone #: _____	AA Sequence (#) _____	Dialog _____
Searcher Location: _____	Structure (#) <u>1</u>	Questel/Orbit _____
Date Searcher Picked Up: _____	Bibliographic _____	Dr. Link _____
Date Completed: <u>6/22/06</u>	Litigation _____	Lexis/Nexis _____
Searcher Prep & Review Time: <u>30</u>	Fulltext _____	Sequence Systems _____
Clerical Prep Time: _____	Patent Family _____	WWW/Internet _____
Online Time: <u>122</u>	Other _____	Other (specify) _____

=> d his full

(FILE 'HOME' ENTERED AT 10:59:14 ON 22 MAY 2006)  
L7 STRUCTURE

FILE 'REGISTRY' ENTERED AT 11:38:15 ON 22 MAY 2006  
L8 39 SEA SSS SAM L7  
L9 6900 SEA SSS FUL L7  
SAV L9 SAC702/A

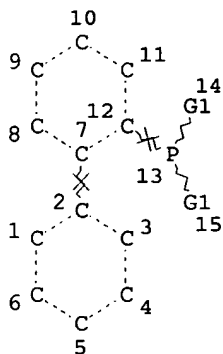
FILE 'HCAPLUS' ENTERED AT 11:48:20 ON 22 MAY 2006  
L10 3128 SEA ABB=ON PLU=ON L9  
L11 1058 SEA ABB=ON PLU=ON L10 (L) PREP/RL  
L12 535 SEA ABB=ON PLU=ON L11 (L) CAT/RL  
L13 QUE ABB=ON PLU=ON SYNTHES? OR MAK? OR PREP?  
L14 20032 SEA ABB=ON PLU=ON ?PHOSPHINE? (L) LIGAND#  
L17 60 SEA ABB=ON PLU=ON L12 (L) L13 (L) L14  
L18 41 SEA ABB=ON PLU=ON L17 AND ORGANOMETAL?/SC,SX  
L19 26 SEA ABB=ON PLU=ON L18 AND (1840-2003)/PRY,AY,PY  
L20 1 SEA ABB=ON PLU=ON L19 AND 2004:722953/AN  
L21 675 SEA ABB=ON PLU=ON L11 AND CAT/RL  
L22 242 SEA ABB=ON PLU=ON L21 AND L13 (L) L14  
L23 41 SEA ABB=ON PLU=ON L21 AND L13 (L) L14 (L) TRANSITION  
(L) METAL#  
L24 37 SEA ABB=ON PLU=ON L23 AND (1840-2003)/PRY,AY,PY  
L25 34 SEA ABB=ON PLU=ON L17 AND (1840-2003)/PRY,AY,PY  
L26 62 SEA ABB=ON PLU=ON L19 OR L24 OR L25

=> file reg

FILE 'REGISTRY' ENTERED AT 13:58:11 ON 22 MAY 2006  
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.  
PLEASE SEE "HELP USAGETERMS" FOR DETAILS.  
COPYRIGHT (C) 2006 American Chemical Society (ACS)

=> d l26 que stat

L7 STR



VAR G1=AK/CY  
NODE ATTRIBUTES:  
NSPEC IS RC AT 13  
DEFAULT MLEVEL IS ATOM  
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:  
RING(S) ARE ISOLATED OR EMBEDDED  
NUMBER OF NODES IS 15

STEREO ATTRIBUTES: NONE  
L9 6900 SEA FILE=REGISTRY SSS FUL L7

L10 3128 SEA FILE=HCAPLUS ABB=ON PLU=ON L9  
 L11 1058 SEA FILE=HCAPLUS ABB=ON PLU=ON L10 (L) PREP/RL  
 L12 535 SEA FILE=HCAPLUS ABB=ON PLU=ON L11 (L) CAT/RL  
 L13 QUE ABB=ON PLU=ON SYNTHES? OR MAK? OR PREP?  
 L14 20032 SEA FILE=HCAPLUS ABB=ON PLU=ON ?PHOSPHINE? (L) LIGAND#  
  
 L17 60 SEA FILE=HCAPLUS ABB=ON PLU=ON L12 (L) L13 (L) L14  
 L18 41 SEA FILE=HCAPLUS ABB=ON PLU=ON L17 AND ORGANOMETAL?/SC,  
 SX  
 L19 26 SEA FILE=HCAPLUS ABB=ON PLU=ON L18 AND (1840-2003)/PRY,  
 AY,PY  
 L21 675 SEA FILE=HCAPLUS ABB=ON PLU=ON L11 AND CAT/RL  
 L23 41 SEA FILE=HCAPLUS ABB=ON PLU=ON L21 AND L13 (L) L14 (L)  
 TRANSITION (L) METAL#  
 L24 37 SEA FILE=HCAPLUS ABB=ON PLU=ON L23 AND (1840-2003)/PRY,  
 AY,PY  
 L25 34 SEA FILE=HCAPLUS ABB=ON PLU=ON L17 AND (1840-2003)/PRY,  
 AY,PY  
 L26 62 SEA FILE=HCAPLUS ABB=ON PLU=ON L19 OR L24 OR L25

=> file hcaplus

FILE 'HCAPLUS' ENTERED AT 14:00:00 ON 22 MAY 2006

USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.

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=> d l26 1-62 ibib abs hitstr hitind

L26 ANSWER 1 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:493613 HCAPLUS

DOCUMENT NUMBER: 143:26729

TITLE: Process for preparing phosphonium  
 tetraarylborate compounds for use together with  
 transition metal complex catalysts in  
 carbon-carbon bond, carbon-nitrogen bond,  
 carbon-oxygen bond formation reactions

INVENTOR(S): Masaoka, Shin; Iwazaki, Hideyuki

PATENT ASSIGNEE(S): Hokko Chemical Industry Co., Ltd., Japan

SOURCE: PCT Int. Appl., 181 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2005051963	A1	20050609	WO 2004-JP17628	20041126

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 CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,  
 GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP,  
 KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,  
 MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD,  
 SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ,  
 VC, VN, YU, ZA, ZM, ZW  
 RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW,  
 AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ,  
 DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LU, MC, NL,  
 PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN,



GQ, GW, ML, MR, NE, SN, TD, TG  
 PRIORITY APPLN. INFO.:

JP 2003-399650

A

200311  
 28

&lt;--

JP 2003-399651

A

200311  
 28

&lt;--

OTHER SOURCE(S): MARPAT 143:26729

AB The title compds. R1R2R3PH.BAR4 (I) [R1 = primary, secondary, or tertiary alkyl, cycloalkyl; R2 = H, primary, secondary, or tertiary alkyl, etc.; R3 = H, aryl, etc.; Ar = aryl] are prepd. by reaction of R1R2R3P [R1 - R3 = as defined above] with HCl or sulfuric acid, followed by reaction with tetraarylborate M.BAR4 [M = Na, etc.; Ar = aryl]. I can be handled under air. Thus, treatment of a soln. of tri-tert-butylphosphine in heptane with HCl, followed by reaction with a soln. of sodium tetraphenylborate in water, gave tri-tert-butylphosphonium tetraphenylborate (II) in 87 mol% yield. II 0.084 g was weighed under air and was added to a flask contg. palladium(II) chloride 0.014 g, triethylamine 0.0194 g, and THF 5.5 mL; the resulting mixt. was stirred at 21°C for 30 min under argon; 4-bromotoluene 1.368 g was added; and the resulting mixt. was stirred at 21°C for 30 min; 2.2 M soln. of phenylmagnesium chloride in THF 4 mL was added dropwise at 21°C over 10 min; and the resulting mixt. was stirred at 21°C for 2 h to give 4-methylbiphenyl in 87 mol% yield.

IT 853073-55-9P

RL: CAT (Catalyst use); SPN (Synthetic preparation);

PREP (Preparation); USES (Uses)

(process for prepg. phosphonium tetraarylborate compds. for use together with transition metal complex catalysts in carbon-carbon bond, carbon-nitrogen bond, carbon-oxygen bond formation reactions)

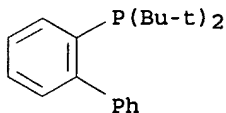
RN 853073-55-9 HCAPLUS

CN Borate(1-), tetraphenyl-, hydrogen, compd. with [1,1'-biphenyl]-2-ylbis(1,1-dimethylethyl)phosphine (1:1) (9CI) (CA INDEX NAME)

CM 1

CRN 224311-51-7

CMF C20 H27 P

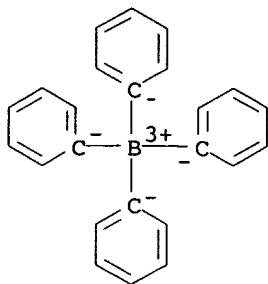


CM 2

CRN 33906-65-9

CMF C24 H20 B . H

CCI CCS



● H<sup>+</sup>

- IC ICM C07F009-54  
ICS C07F005-02; C07B037-02; B01J031-24; C07F015-00
- CC 29-7 (Organometallic and Organometalloidal Compounds)  
Section cross-reference(s): 21, 25
- ST phosphonium tetraarylborate **prepn** coupling reaction  
**transition metal catalyst ligand;**  
**phosphine salt compd** reaction tetraarylborate
- IT Coordination compounds  
RL: **CAT (Catalyst use); USES (Uses)**  
(allyl complexes with transition metals; process for prepg. phosphonium tetraarylborate compds. for use together with transition metal complex catalysts in carbon-carbon bond, carbon-nitrogen bond, carbon-oxygen bond formation reactions)
- IT Transition metal salts  
RL: **CAT (Catalyst use); USES (Uses)**  
(ammonium; process for prepg. phosphonium tetraarylborate compds. for use together with transition metal complex catalysts in carbon-carbon bond, carbon-nitrogen bond, carbon-oxygen bond formation reactions)
- IT Transition metal salts  
RL: **CAT (Catalyst use); USES (Uses)**  
(borates; process for prepg. phosphonium tetraarylborate compds. for use together with transition metal complex catalysts in carbon-carbon bond, carbon-nitrogen bond, carbon-oxygen bond formation reactions)
- IT Transition metal salts  
RL: **CAT (Catalyst use); USES (Uses)**  
(carbonates; process for prepg. phosphonium tetraarylborate compds. for use together with transition metal complex catalysts in carbon-carbon bond, carbon-nitrogen bond, carbon-oxygen bond formation reactions)
- IT Amines, uses  
Carbonyl complexes  
RL: **CAT (Catalyst use); USES (Uses)**  
(complexes with transition metals; process for prepg. phosphonium tetraarylborate compds. for use together with transition metal complex catalysts in carbon-carbon bond, carbon-nitrogen bond, carbon-oxygen bond formation reactions)
- IT Transition metal halides  
RL: **CAT (Catalyst use); USES (Uses)**  
(fluorides; process for prepg. phosphonium tetraarylborate compds. for use together with transition metal complex catalysts in carbon-carbon bond, carbon-nitrogen bond, carbon-oxygen bond formation reactions)
- IT Transition metal halides  
RL: **CAT (Catalyst use); USES (Uses)**  
(iodides; process for prepg. phosphonium tetraarylborate compds.

- for use together with transition metal complex catalysts in carbon-carbon bond, carbon-nitrogen bond, carbon-oxygen bond formation reactions)
- IT Transition metal salts  
 RL: CAT (Catalyst use); USES (Uses)  
 (nitrates; process for prepg. phosphonium tetraarylborate compds. for use together with transition metal complex catalysts in carbon-carbon bond, carbon-nitrogen bond, carbon-oxygen bond formation reactions)
- IT Transition metal salts  
 RL: CAT (Catalyst use); USES (Uses)  
 (nitrites; process for prepg. phosphonium tetraarylborate compds. for use together with transition metal complex catalysts in carbon-carbon bond, carbon-nitrogen bond, carbon-oxygen bond formation reactions)
- IT Transition metal salts  
 RL: CAT (Catalyst use); USES (Uses)  
 (potassium; process for prepg. phosphonium tetraarylborate compds. for use together with transition metal complex catalysts in carbon-carbon bond, carbon-nitrogen bond, carbon-oxygen bond formation reactions)
- IT Transition metal chlorides  
 Transition metal oxides  
 Transition metal salts  
 Transition metals, uses  
 RL: CAT (Catalyst use); USES (Uses)  
 (process for prepg. phosphonium tetraarylborate compds. for use together with transition metal complex catalysts in carbon-carbon bond, carbon-nitrogen bond, carbon-oxygen bond formation reactions)
- IT Transition metal salts  
 RL: CAT (Catalyst use); USES (Uses)  
 (sodium; process for prepg. phosphonium tetraarylborate compds. for use together with transition metal complex catalysts in carbon-carbon bond, carbon-nitrogen bond, carbon-oxygen bond formation reactions)
- IT Transition metal salts  
 RL: CAT (Catalyst use); USES (Uses)  
 (sulfates; process for prepg. phosphonium tetraarylborate compds. for use together with transition metal complex catalysts in carbon-carbon bond, carbon-nitrogen bond, carbon-oxygen bond formation reactions)
- IT Cyanides (inorganic), uses  
 Hydrides  
 Sulfides, uses  
 RL: CAT (Catalyst use); USES (Uses)  
 (transition metal salts; process for prepg. phosphonium tetraarylborate compds. for use together with transition metal complex catalysts in carbon-carbon bond, carbon-nitrogen bond, carbon-oxygen bond formation reactions)
- IT Fluorides, uses  
 RL: CAT (Catalyst use); USES (Uses)  
 (transition metal; process for prepg. phosphonium tetraarylborate compds. for use together with transition metal complex catalysts in carbon-carbon bond, carbon-nitrogen bond, carbon-oxygen bond formation reactions)
- IT 64-19-7D, Acetic acid, transition metal salts 74-85-1D, Ethene, complexes with transition metals 75-05-8D, Acetonitrile, complexes with transition metals 76-05-1D, transition metal salts 100-47-0D, Benzonitrile, complexes with transition metals 106-99-0D, Butadiene, complexes with transition metals 107-15-3D, 1,2-Ethanediamine, complexes with transition metals 110-86-1D, Pyridine, complexes with transition metals 123-54-6D, Acetylacetone, transition metal salts 538-58-9D, complexes with transition metals 542-92-7D, 1,3-Cyclopentadiene, complexes with transition metals 603-35-0D, Triphenylphosphine, complexes with

transition metals 629-20-9D, Cyclooctatetraene, complexes with  
 transition metals 3375-31-3 7439-89-6, Iron, uses 7439-96-5,  
 Manganese, uses 7440-02-0, Nickel, uses 7440-05-3, Palladium,  
 uses 7440-06-4, Platinum, uses 7440-16-6, Rhodium, uses  
 7440-18-8, Ruthenium, uses 7440-48-4, Cobalt, uses 7647-10-1,  
 Palladium(II) chloride 13597-73-4D, Disiloxane, complexes with  
 transition metals 29965-97-7D, Cyclooctadiene, complexes with  
 transition metals 51364-51-3, Tris(dibenzylideneacetone)dipalladiu  
 m 72617-31-3, Butyldicyclohexylphosphine

RL: CAT (Catalyst use); USES (Uses)

(process for prepg. phosphonium tetraarylborate compds. for use  
 together with transition metal complex catalysts in carbon-carbon  
 bond, carbon-nitrogen bond, carbon-oxygen bond formation  
 reactions)

IT 6002-40-0, Di-tert-butylmethylphosphine 32673-25-9,  
 Di-tert-butylphenylphosphine

RL: CAT (Catalyst use); RCT (Reactant); RACT (Reactant or  
 reagent); USES (Uses)

(process for prepg. phosphonium tetraarylborate compds. for use  
 together with transition metal complex catalysts in carbon-carbon  
 bond, carbon-nitrogen bond, carbon-oxygen bond formation  
 reactions)

IT 20573-48-2P 131322-08-2P 155234-93-8P 853073-44-6P  
 853073-45-7P 853073-46-8P 853073-47-9P 853073-48-0P  
 853073-50-4P 853073-51-5P 853073-53-7P 853073-54-8P  
 853073-55-9P 853073-56-0P 853073-57-1P 853073-59-3P  
 853073-61-7P 853073-62-8P 853073-63-9P 853073-64-0P  
 853073-65-1P 853073-66-2P

RL: CAT (Catalyst use); SPN (Synthetic preparation);

PREP (Preparation); USES (Uses)

(process for prepg. phosphonium tetraarylborate compds. for use  
 together with transition metal complex catalysts in carbon-carbon  
 bond, carbon-nitrogen bond, carbon-oxygen bond formation  
 reactions)

REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR  
 THIS RECORD. ALL CITATIONS AVAILABLE IN  
 THE RE FORMAT

L26 ANSWER 2 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:253273 HCAPLUS

DOCUMENT NUMBER: 142:316957

TITLE: Preparation of chiral biphenyl-2,2'-diyl  
 diphosphines substituted by alkoxy carbonyl  
 groups for use in asymmetric hydrogenation of  
 ketones and imines

INVENTOR(S): Artl, Dieter; Meseguer, Benjamin

PATENT ASSIGNEE(S): Bayer Chemicals A.-G., Germany

SOURCE: Eur. Pat. Appl., 20 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: German

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1516880	A1	20050323	EP 2004-21174	200409 07

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R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC,  
 PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU,  
 PL, SK, HR

DE 10342672	A1	20050421	DE 2003-10342672	200309
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JP 2005089462

A2

20050407

JP 2004-267421

16

200409

14

US 2005085377

A1

20050421

US 2004-940785

200409

14

PRIORITY APPLN. INFO.:

DE 2003-10342672

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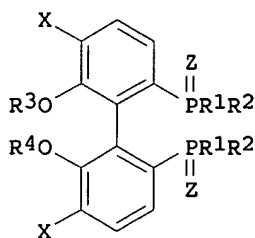
200309

16

OTHER SOURCE(S):

MARPAT 142:316957

GI



AB Chiral (1R)- and (1S)-1,1'-biphenyl-2,2'-bis(phosphines) (I, Z = none, X = H, Cl, Br; R1 = R2 = Ph, cyclohexyl, 3,5-tBu-4-MeOC6H2, 3,5-Me2-4-MeOC6H2, 3,5-tBu2C6H3, 4-FC6H4; R3 = R4 = RO2CCH2, RO2CCHMe, where R = Me, Et; or R3 = cyclohexyl, R4 = RO2CCH2, RO2CCHMe, same R), useful as ligands for asym. hydrogenation of prochiral ketones and imines (no data) and acetoacetate, were prepd. by demethylation of corresponding phosphine oxides I (Z = O; R3 = R4 = Me, same X, R1, R2), followed by etherification of 6,6'-diols with R3Y, preferably cyclohexyl bromide, and RO2CCH2Br or RO2CCHMeBr and redn. by HSiCl3 and used as ligands for asym. hydrogenation of Et acetoacetate and Et chloroacetate. In an example, compd. (S)-I (Z = O, X = Cl, R3 = R4 = H, R1 = R2 = Ph) was prepd. by reaction of the corresponding dimethoxy-deriv. with BBr3, followed by water hydrolysis; the diol was reacted with MeO2CH2Br to give I (Z = O, X = Cl, R3 = R4 = MeO2CCH2, R1 = R2 = Ph), which was reduced by HSiCl3 to give the corresponding diphosphine I (5, Z = none, same X, R1-R4). Asym. hydrogenation of Me acetoacetate in the presence of 0.02 mol% of 5 and 0.01 mol% of RuCl3 in ethanol under 90 atm of H2 for 1 h at 80° gave Me 3-hydroxybutyrate with 97.4 % ee.

IT 848078-18-2P 848078-19-3P 848078-20-6P  
848078-21-7P

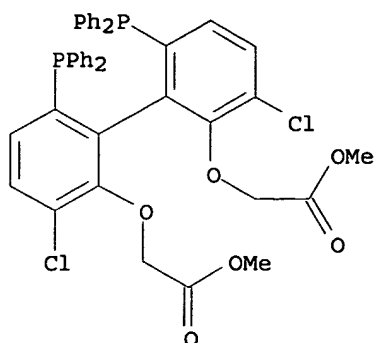
RL: CAT (Catalyst use); SPN (Synthetic preparation);

PREP (Preparation); USES (Uses)

(asym. hydrogenation ligand; prepn. of  
axial-chiral biphenyl-2,2'-diphosphines contg.  
alkoxycarbonylalkoxy groups as ligands for asym.  
hydrogenation of ketones)

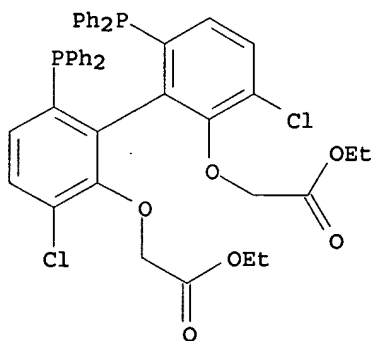
RN 848078-18-2 HCAPLUS

CN Acetic acid, 2,2'-[[(1S)-3,3'-dichloro-6,6'-  
bis(diphenylphosphino)[1,1'-biphenyl]-2,2'-diyl]bis(oxy)]bis-,  
dimethyl ester (9CI) (CA INDEX NAME)



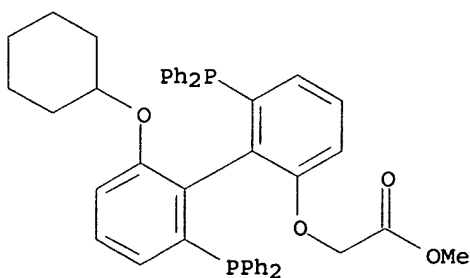
RN 848078-19-3 HCAPLUS

CN Acetic acid, 2,2'-[[[(1S)-3,3'-dichloro-6,6'-bis(diphenylphosphino)[1,1'-biphenyl]-2,2'-diyl]bis(oxy)]bis-, diethyl ester (9CI) (CA INDEX NAME)



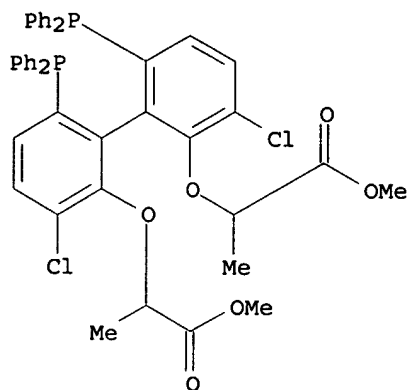
RN 848078-20-6 HCAPLUS

CN Acetic acid, [[[(1S)-2'-(cyclohexyloxy)-6,6'-bis(diphenylphosphino)[1,1'-biphenyl]-2-yl]oxy]-, methyl ester (9CI) (CA INDEX NAME)



RN 848078-21-7 HCAPLUS

CN Propanoic acid, 2,2'-[[[(1S)-3,3'-dichloro-6,6'-bis(diphenylphosphino)[1,1'-biphenyl]-2,2'-diyl]bis(oxy)]bis-, dimethyl ester (9CI) (CA INDEX NAME)



IC ICM C07F009-50  
 ICS C07F009-53; C07F015-00; C07B053-00; B01J031-24; C07M007-00  
 CC 29-7 (Organometallic and Organometalloidal  
 Compounds)  
 Section cross-reference(s): 25  
 IT 848078-18-2P 848078-19-3P 848078-20-6P  
 848078-21-7P  
 RL: CAT (Catalyst use); SPN (Synthetic preparation);  
 PREP (Preparation); USES (Uses)  
 (asym. hydrogenation ligand; prepn. of  
 axial-chiral biphenyl-2,2'-diphosphines contg.  
 alkoxy carbonylalkoxy groups as ligands for asym.  
 hydrogenation of ketones)  
 REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR  
 THIS RECORD. ALL CITATIONS AVAILABLE IN  
 THE RE FORMAT

L26 ANSWER 3 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2005:235113 HCAPLUS  
 DOCUMENT NUMBER: 142:297866  
 TITLE: Ruthenium compounds having phosphine ligands and  
 diamine ligands, their use as asymmetric  
 hydrogenation catalysts, and preparation of  
 optically-active alcohols using them  
 INVENTOR(S): Ooka, Koji; Inoue, Tsutomu  
 PATENT ASSIGNEE(S): Nippon Soda Co., Ltd., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 23 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2005068113	A2	20050317	JP 2003-303471	200308 27

PRIORITY APPLN. INFO.: JP 2003-303471  
 200308  
 27

OTHER SOURCE(S): MARPAT 142:297866  
 AB Ru(X)(Y)(Px)n(A) [X, Y = H, halo, CO<sub>2</sub>H, OH, C1-20 alkoxy; Px =  
 phosphine ligand; A = R<sub>1</sub>CH(NH<sub>2</sub>)CH<sub>2</sub>NR<sub>2</sub>R<sub>3</sub>, R<sub>1</sub>CH(NR<sub>2</sub>R<sub>3</sub>)CH<sub>2</sub>NH<sub>2</sub> [R<sub>1</sub> =  
 (un)substituted C1-20 alkyl, C2-20 alkenyl, C3-8 cycloalkyl, C7-20

aralkyl, aryl, heterocyclyl; R2, R3 = H, (un)substituted C1-20 alkyl, C2-20 alkenyl, C3-8 cycloalkyl, C7-20 aralkyl; R2 and R3 may be bonded together to form a ring; R2 and/or R3 = substituent]], useful as asym. hydrogenation catalysts, are claimed. Also claimed is a method for prepn. of optically-active alcs. by hydrogenation of carbonyl compds. in the presence of the Ru compds. Thus, a mixt. of an isopropanol soln. of KOH, (R)-H2NCHPhCH2NMe2, PhCOMe, and RuCl2[(S)-tolbinap](DMF)<sub>n</sub> (tolbinap = 2,2'-bis(di-p-tolylphosphino)-1,1'-binaphthyl) was autoclaved with 8 atm H2O at room temp. for 1 h to give (S)-PhCHMeOH (91% e.e.) at ≥99% conversion.

IT 847696-13-3P

RL: CAT (Catalyst use); SPN (Synthetic preparation);

PREP (Preparation); USES (Uses)

(Ru compds. having phosphine ligands and diamine ligands and their use as asym. hydrogenation catalysts for prepn. of optically-active alcs. from carbonyl compds.)

RN 847696-13-3 HCAPLUS

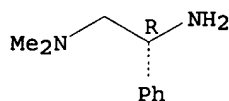
CN Ruthenium, [(1S)-[1,1'-binaphthalene]-2,2'-diylbis[diphenylphosphine-κP]]dichloro-, (SP-4-2)-, compd. with (1R)-N2,N2-dimethyl-1-phenyl-1,2-ethanediamine (1:1) (9CI) (CA INDEX NAME)

CM 1

CRN 174636-94-3

CMF C10 H16 N2

Absolute stereochemistry.

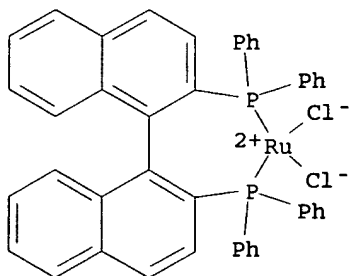


CM 2

CRN 134524-84-8

CMF C44 H32 Cl2 P2 Ru

CCI CCS



IC ICM C07F009-50

ICS B01J031-24; C07C029-145; C07C033-20; C07C033-22; C07C033-30; C07C211-65; C07C231-18; C07C233-73; C07C269-06; C07C271-16; C07B053-00; C07B061-00; C07F015-00; C07M007-00

CC 25-7 (Benzene, Its Derivatives, and Condensed Benzenoid Compounds)  
Section cross-reference(s): 29, 67

IT 847696-13-3P

RL: CAT (Catalyst use); SPN (Synthetic preparation);

PREP (Preparation); USES (Uses)

(Ru compds. having phosphine ligands and



diamine ligands and their use as asym. hydrogenation catalysts for prepn. of optically-active alcs. from carbonyl compds.)

L26 ANSWER 4 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:158682 HCAPLUS

DOCUMENT NUMBER: 142:272798

TITLE: Preparation of novel transition metal complex and process for producing optically active alcohol with the complex

INVENTOR(S): Mikami, Koichi; Sayo, Noboru

PATENT ASSIGNEE(S): Takasago International Corporation, Japan

SOURCE: PCT Int. Appl., 107 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2005016943	A1	20050224	WO 2004-JP11693	20040813

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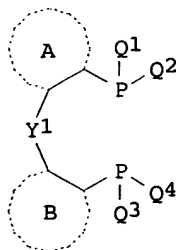
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RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

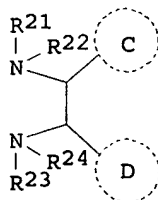
PRIORITY APPLN. INFO.: JP 2003-293145 A 20030813

OTHER SOURCE(S): MARPAT 142:272798  
GI

Q=



Q5=



AB There are provided a novel transition metal complex of formula  $[LMXpZl_n]$ , preferably a ruthenium-phosphine complex or rhodium-phosphine complex, [L = Q; ring A and B = independently arom. ring; wherein Q1, Q2, Q3, Q4 = independently (un)substituted aryl or alicyclic group; Y1 = a spacer; M = transition metal; X = halo, anion; Zl = Q5; ring C and D = independently (un)substituted Ph or

alicyclic group; R21, R22, R23, R24 = independently H or alkyl; p = 1,2; n = an integer] which is effectively usable in various asym. syntheses and, in particular, is more effectively usable in the asym. hydrogenation of various ketones; and a novel process for producing an optically active alc. with the complex. These novel transition metal complexes include a ligand obtained by introducing a diarylphosphino group into each of the 2- and 2'-positions of di-Ph ether, benzophenone, benzhydrol, or the like. They preferably further includes an optically active 1,2-diphenylethylenediamine coordinated thereto. The complexes preferably are novel diphosphine -ruthenium-optically active diamine complexes or diphosphine -rhodium-optically active diamine complexes. The process comprises using the complex as an asym. hydrogenation catalyst to conduct the asym. hydrogenation of a ketone compd. to thereby obtain an optically active alc. having a high optical purity in a high yield. Thus, 98.2 mg 2,2'-difluorobenzophenone was dissolve din 6 mL THF, heated to 70°, treated with 2.8 mL potassium diphenylphosphine, and refluxed 2.5 h to give 13% 2,2'-bis(diphenylphosphino)benzophenone which (6.6 mg) was stirred with 3.0 mg benzeneruthenium chloride dimer in 1 mL DMF at 100° for 45 min, followed by distg. away the solvent under reduced pressure to give RuCl<sub>2</sub>[2,2'-bis(diphenylphosphino)benzophenone] (DMF)<sub>n</sub> (I). (1S,2S)-1,2-diphenylethylenediamine [(S,S)-DPEN] (2.6 mg) and 0.8 mL CH<sub>2</sub>Cl<sub>2</sub> were added to I obtained above and stirred for 30 min, followed by distg. away the solvent under reduced pressure to give >99% RuCl<sub>2</sub>[2,2'-bis(diphenylphosphino)benzophenone][(S,S)-DPEN] (II). I (0.4 mol%), 0.4 mol% (S,S)-DPEN, 402.5 mg 2'-methylacetophenone, 1.3 mg KOH, and 3.3. mL 2-propanol were added to a stainless steel autoclave, and allowed to react at room temp. under H pressure of 0.8 MPa (8 atm) with stirring for 4 h to give ≥99% (1R)-1-(2-phenyl)ethanol (optical purity 96% ee).

IT 845822-02-8P

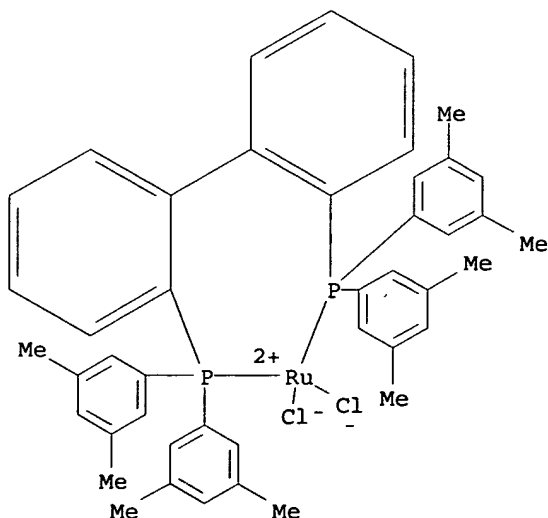
RL: CAT (Catalyst use); SPN (Synthetic preparation);

PREP (Preparation); USES (Uses)

(prepn. of transition metal complexes as asym. hydrogenation catalysts for producing optically active alc. by asym. hydrogenation of ketones)

RN 845822-02-8 HCAPLUS

CN Ruthenium, [1,1'-biphenyl]-2,2'-diylbis[bis(3,5-dimethylphenyl)phosphine-κP]dichloro- (9CI) (CA INDEX NAME)



IC ICM C07F009-50  
ICS C07B053-00; C07C029-145; C07C033-20; C07C211-27; B01J031-24;  
C07F015-00

CC 78-7 (Inorganic Chemicals and Reactions)  
Section cross-reference(s): 25

IT 134524-84-8 845910-46-5  
RL: CAT (Catalyst use); USES (Uses)  
(prepn. of transition metal complexes as asym. hydrogenation  
catalysts for producing optically active alc. by asym.  
hydrogenation of ketones)

IT 845821-93-4P 845821-97-8P  
RL: CAT (Catalyst use); RCT (Reactant); SPN (Synthetic  
preparation); PREP (Preparation); RACT (Reactant or reagent); USES  
(Uses)  
(prepn. of transition metal complexes as asym. hydrogenation  
catalysts for producing optically active alc. by asym.  
hydrogenation of ketones)

IT 845821-91-2P 845821-94-5P 845822-00-6P 845822-02-8P  
845822-04-0P 845822-06-2P  
RL: CAT (Catalyst use); SPN (Synthetic preparation);  
PREP (Preparation); USES (Uses)  
(prepn. of transition metal complexes as asym. hydrogenation  
catalysts for producing optically active alc. by asym.  
hydrogenation of ketones)

REFERENCE COUNT: 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR  
THIS RECORD. ALL CITATIONS AVAILABLE IN  
THE RE FORMAT

L26 ANSWER 5 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2005:71178 HCAPLUS  
DOCUMENT NUMBER: 142:189591  
TITLE: Preparation of group VIII  
transition metal complexes  
with chiral phosphine and chiral  
diamine ligands as catalysts for  
asymmetric hydrogenation reactions  
INVENTOR(S): Hems, William Patrick; Grasa, Gabriela Alexandra  
PATENT ASSIGNEE(S): Johnson Matthey PLC, UK  
SOURCE: PCT Int. Appl., 29 pp.  
CODEN: PIXXD2  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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WO 2005007662	A2	20050127	WO 2004-GB2938	200407 07

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WO 2005007662 A3 20050324

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GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP,  
KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,  
MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD,  
SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ,  
VC, VN, YU, ZA, ZM, ZW

RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW,  
AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ,  
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PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ,  
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EP 1651657 A2 20060503 EP 2004-743281

200407  
07

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R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC,  
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PRIORITY APPLN. INFO.:

GB 2003-16439

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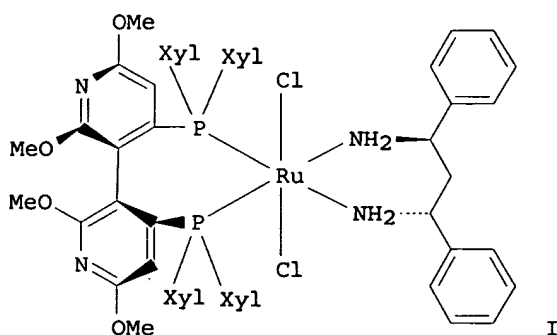
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WO 2004-GB2938

W

200407  
07OTHER SOURCE(S):  
GI

CASREACT 142:189591; MARPAT 142:189591



AB Catalysts suitable for asym. hydrogenation reactions are described comprising the reaction product of a group VIII transition metal compd. a chiral phosphine and a chiral diamine [R<sub>1</sub>R<sub>2</sub>NC(R<sub>5</sub>)(R<sub>6</sub>)-A-C(R<sub>7</sub>)(R<sub>8</sub>)NR<sub>3</sub>R<sub>4</sub>] in which R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> are independently hydrogen, a satd. or unsatd. alkyl, or cycloalkyl group, an aryl group, a urethane or sulfonyl group and R<sub>5</sub>, R<sub>6</sub>, R<sub>7</sub> and R<sub>8</sub> are independently hydrogen, a satd. or unsatd. alkyl or cycloalkyl group, or an aryl group, and at least one of R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> or R<sub>4</sub> is hydrogen and A is a linking group comprising one or two substituted or unsubstituted carbon atoms. Thus, [{(R)XYL-P-Phos}RuCl<sub>2</sub>{(R,R)-Dppn}] (I) was prepd. and was shown to catalyze the hydrogenation of acetophenone to 1-phenylethanol with 100% conversion and 95% ee.

IT 749217-00-3P 832117-66-5P 832117-81-4P  
832117-83-6P 832117-85-8P 832117-86-9P  
832747-72-5P 832747-73-6P 832747-75-8P  
832747-76-9P 832747-77-0P 832747-78-1P  
832747-87-2P 832747-88-3P

RL: CAT (Catalyst use); SPN (Synthetic preparation);

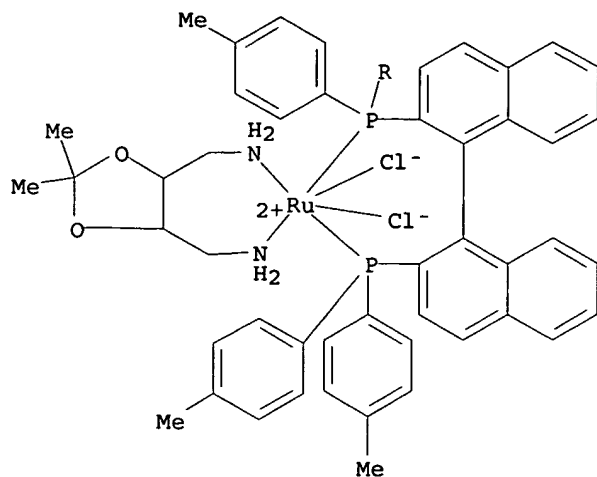
PREP (Preparation); USES (Uses)

(prepn. of group VIII transition  
metal complexes with chiral phosphine and  
chiral diamine ligands as catalysts for asym.  
hydrogenation of ketones)

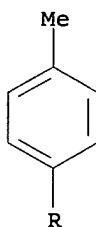
RN 749217-00-3 HCAPLUS

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(CA INDEX NAME)

PAGE 1-A



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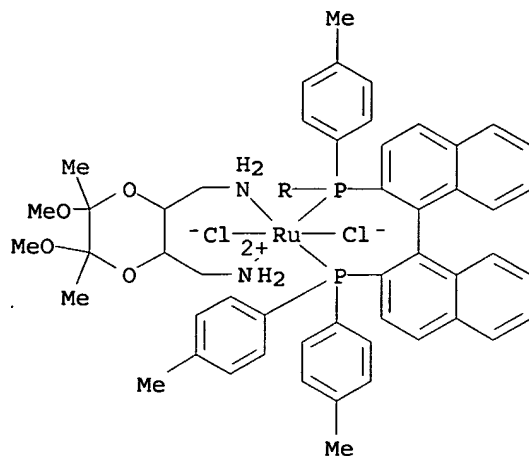


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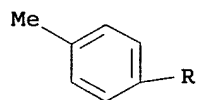
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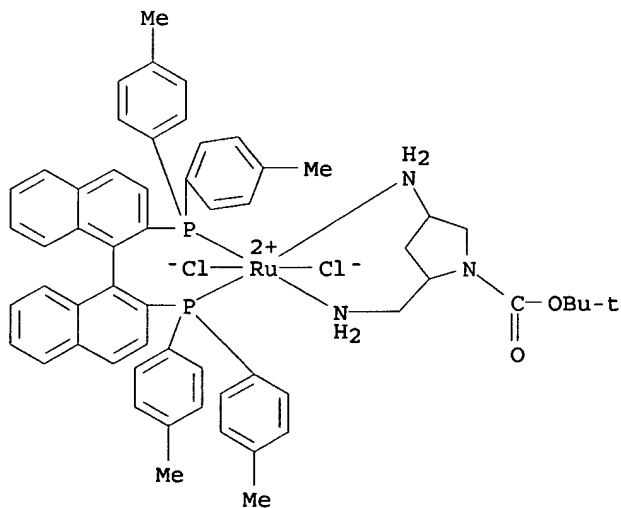
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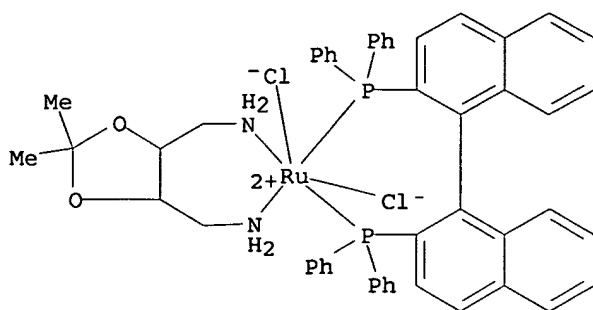
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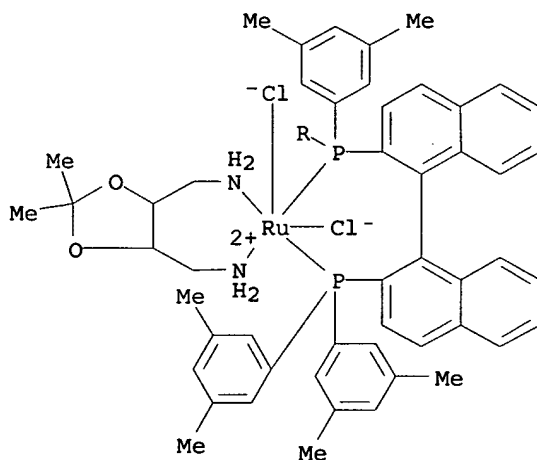


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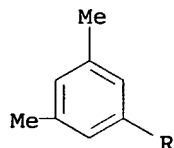


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 (CA INDEX NAME)

PAGE 1-A

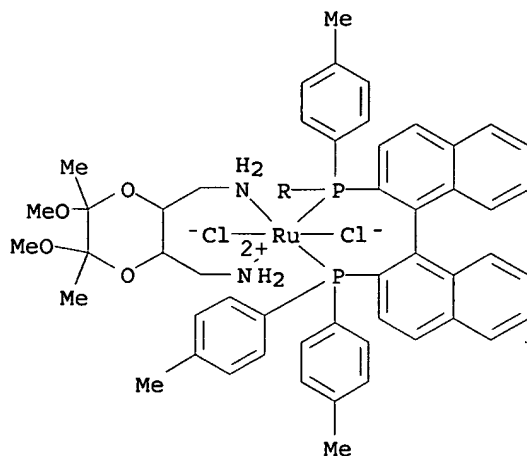


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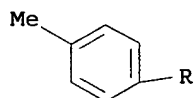


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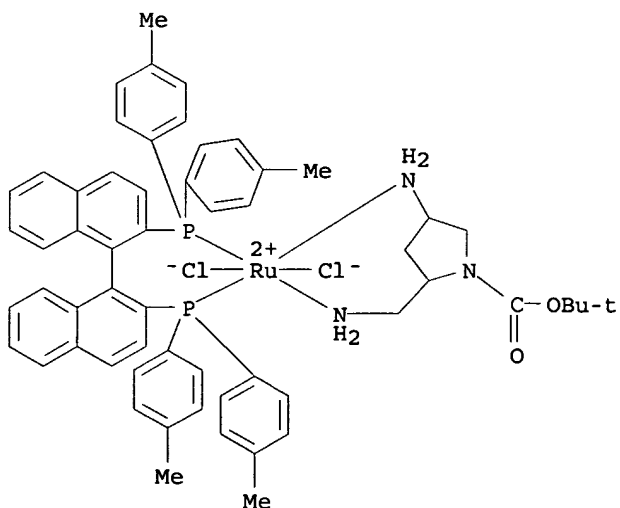
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PAGE 2-A



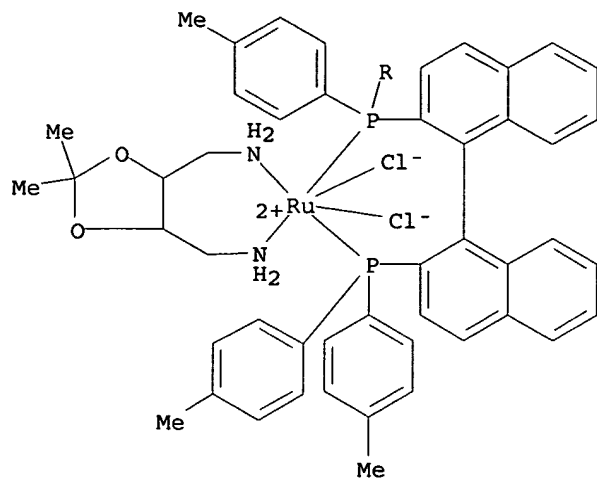
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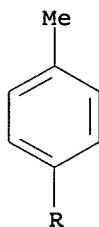
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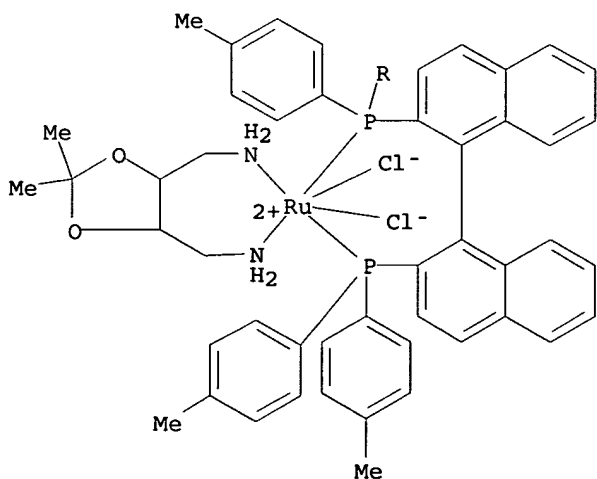


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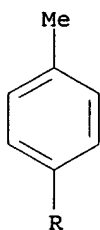


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 (CA INDEX NAME)

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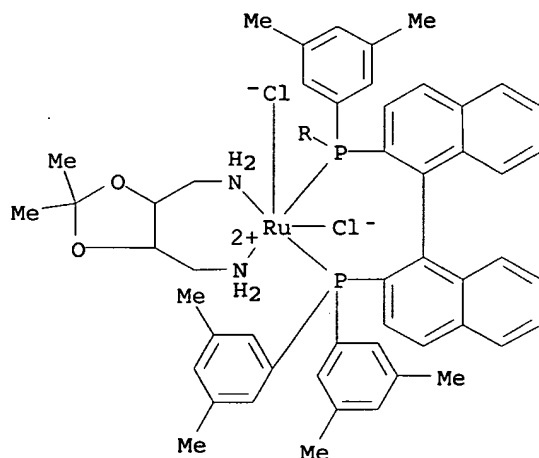


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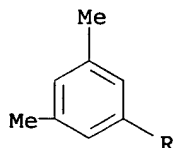


RN 832747-77-0 HCAPLUS  
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 (CA INDEX NAME)

PAGE 1-A

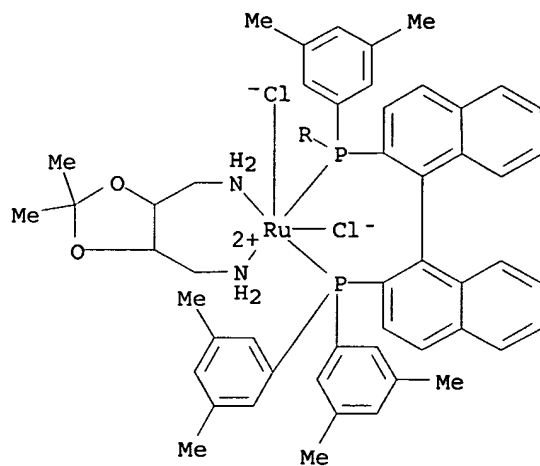


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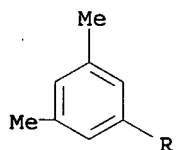


RN 832747-78-1 HCAPLUS  
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 (CA INDEX NAME)

PAGE 1-A

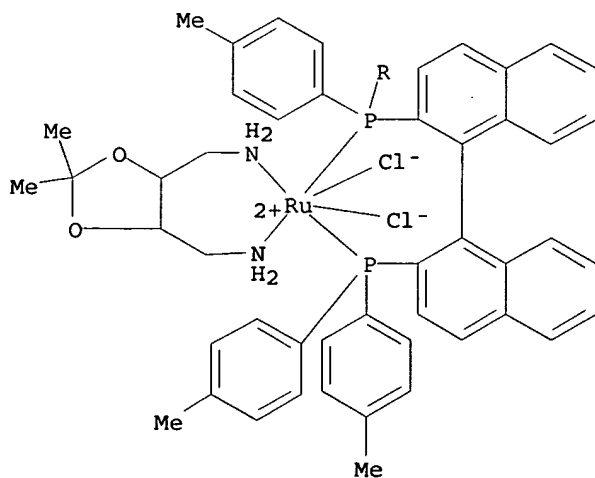


PAGE 2-A

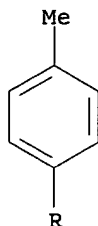


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 CN Ruthenium, [(1S)-[1,1'-binaphthalene]-2,2'-diylbis[bis(4-methylphenyl)phosphine-κP]]dichloro[(4S,5S)-2,2-dimethyl-1,3-dioxolane-4,5-dimethanamine-κN4,κN5]-, (OC-6-13)- (9CI)  
 (CA INDEX NAME)

PAGE 1-A

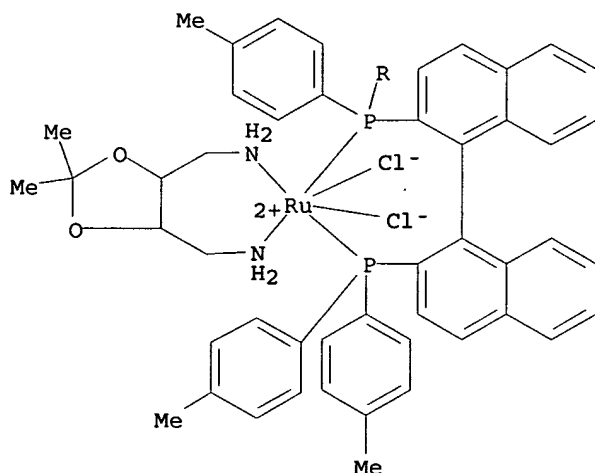


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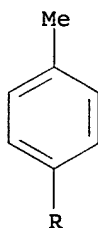


RN 832747-88-3 HCAPLUS  
 CN Ruthenium, [(1S)-[1,1'-binaphthalene]-2,2'-diylbis[bis(4-methylphenyl)phosphine-κP]]dichloro[rel-(4R,5R)-2,2-dimethyl-1,3-dioxolane-4,5-dimethanamine-κN4,κN5]-, (OC-6-13)-(9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 2-A



IC ICM C07F015-00  
 ICS C07D207-14  
 CC 78-7 (Inorganic Chemicals and Reactions)  
 Section cross-reference(s): 21, 67  
 IT Amines, preparation  
 RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP  
 (Preparation); USES (Uses)  
 (Group VIII element complexes; prepn. of group VIII  
 transition metal complexes with chiral  
 phosphine and chiral diamine ligands as

- catalysts for asym. hydrogenation of ketones)
- IT Group VIII element complexes  
 RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
 (amine; **prepn.** of group VIII **transition metal** complexes with chiral **phosphine** and chiral diamine ligands as catalysts for asym. hydrogenation of ketones)
- IT Alcohols, **preparation**  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (asym. hydrogenation of ketones catalyzed by group VIII **transition metal** complexes with chiral **phosphine** and chiral diamine ligands)
- IT Transition metal complexes  
 RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
 (**phosphine**, Group VIII; **prepn.** of group VIII **transition metal** complexes with chiral **phosphine** and chiral diamine ligands as catalysts for asym. hydrogenation of ketones)
- IT Asymmetric **synthesis** and induction  
 (**prepn.** of group VIII **transition metal** complexes with chiral **phosphine** and chiral diamine ligands as catalysts for asym. hydrogenation of ketones)
- IT Hydrogenation  
 Hydrogenation catalysts  
 (stereoselective; **prepn.** of group VIII **transition metal** complexes with chiral **phosphine** and chiral diamine ligands as catalysts for asym. hydrogenation of ketones)
- IT **Phosphines**  
 RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
 (**transition metal** complexes, Group VIII; **prepn.** of group VIII **transition metal** complexes with chiral **phosphine** and chiral diamine ligands as catalysts for asym. hydrogenation of ketones)
- IT 832747-68-9  
 RL: CAT (Catalyst use); USES (Uses)  
 (catalyst for **prepn.** of chiral diol precursor from dibenzoylmethane in synthesis of chiral diamine ligand for ruthenium complex)
- IT 7440-18-8DP, Ruthenium, chiral diamine **phosphine** complexes  
 749217-00-3P 832117-60-9P 832117-66-5P  
 832117-81-4P 832117-83-6P 832117-84-7P  
 832117-85-8P 832117-86-9P 832117-88-1P  
 832117-89-2P 832117-97-2P 832747-69-0P 832747-70-3P  
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 832747-74-7P 832747-75-8P 832747-76-9P  
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 832747-80-5P 832747-81-6P 832747-82-7P 832747-83-8P  
 832747-84-9P 832747-85-0P 832747-86-1P 832747-87-2P  
 832747-88-3P  
 RL: CAT (Catalyst use); SPN (Synthetic preparation);  
 PREP (Preparation); USES (Uses)  
 (**prepn.** of group VIII **transition metal** complexes with chiral **phosphine** and chiral diamine ligands as catalysts for asym. hydrogenation of ketones)
- IT 120-46-7, Dibenzoylmethane 431-03-8, 2,3-Butadione 608-68-4  
 21932-24-1 37002-45-2 37366-09-9, (Benzene)dichlororuthenium  
 dimer 59158-71-3 61478-26-0 76189-56-5, (S)-Binap 99646-28-3  
 100165-88-6 111320-77-5 135139-00-3 137219-86-4 221012-82-4  
 362524-23-0 364732-88-7 442905-33-1 443347-10-2  
 RL: RCT (Reactant); RACT (Reactant or reagent)

(prepn. of group VIII transition  
metal complexes with chiral phosphine and  
chiral diamine ligands as catalysts for asym.  
hydrogenation of ketones)

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326596-48-9P 832117-78-9P 832117-79-0P 832747-53-2P  
832747-54-3P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation);  
RACT (Reactant or reagent)

(prepn. of group VIII transition  
metal complexes with chiral phosphine and  
chiral diamine ligands as catalysts for asym.  
hydrogenation of ketones)

L26 ANSWER 6 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:1127391 HCAPLUS

DOCUMENT NUMBER: 142:56522

TITLE: Chiral ligands for application in asymmetric  
syntheses

INVENTOR(S): Mesequer, Benjamin; Arlt, Dieter

PATENT ASSIGNEE(S): Bayer Chemicals Ag, Germany

SOURCE: PCT Int. Appl., 28 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: German

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004111063	A2	20041223	WO 2004-EP5930	20040602

WO 2004111063 A3 20050331

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA,  
CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,  
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP,  
KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,  
MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD,  
SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ,  
VC, VN, YU, ZA, ZM, ZW

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AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ,  
DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL,  
PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ,  
GW, ML, MR, NE, SN, TD, TG

DE 10327109	A1	20041230	DE 2003-10327109	20030613
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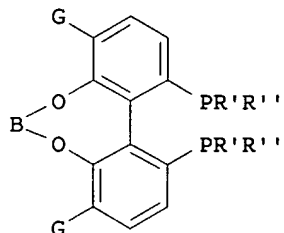
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PT, IE, SI, FI, RO, CY, TR, BG, CZ, EE, HU, PL, SK

PRIORITY APPLN. INFO.: DE 2003-10327109 A 20030613

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 DE 2003-10337013 A 200308  
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 WO 2004-EP5930 W 200406  
 02

OTHER SOURCE(S): CASREACT 142:56522; MARPAT 142:56522  
 GI



I

AB The invention relates to the prepn. of biaryl bisphosphines I (B = (CHR<sub>1</sub>)<sub>n</sub>(R<sub>2</sub>C:CR<sub>3</sub>)(CHR<sub>4</sub>)<sub>m</sub>, R<sub>1</sub>-R<sub>4</sub> = H, alkyl, n, m = 1-8; G = Cl, H; R', R'' = aryl, alkyl) and intermediates thereof. Furthermore, the invention relates to catalysts produced from the biaryl bisphosphines and the use thereof in asym. syntheses. Thus, reaction of (S)-[5,5'-dichloro-6,6'-dihydroxybiphenyl-2,2'-diyl]bis(diphenylphosphine oxide) with allyl chloride in DMF in the presence of K<sub>2</sub>CO<sub>3</sub> gave (S)-[5,5'-dichloro-6,6'-(1,4-but-2-enedioxy)biphenyl-2,2'-diyl]bis(diphenylphosphine oxide) as cocatalyst for ruthenium catalyzed enantioselective hydrogenation.

IT 810674-60-3P 810674-65-8P 810674-66-9P  
 810674-70-5P 810674-71-6P 810674-72-7P  
 810674-73-8P 810674-74-9P 810674-75-0P  
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 810674-79-4P 810674-80-7P 810674-81-8P  
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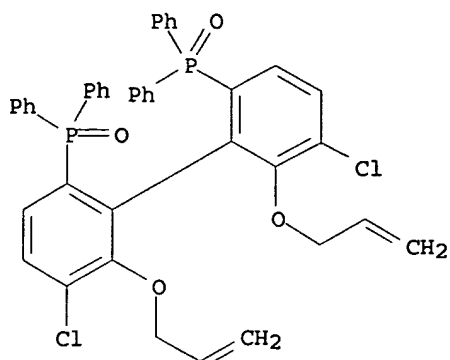
RL: CAT (Catalyst use); SPN (Synthetic preparation);

PREP (Preparation); USES (Uses)

(prepn. of biaryl bisphosphines as chiral  
 ligands for ruthenium complex catalyzed enantioselective  
 hydrogenation or in asym. synthesis)

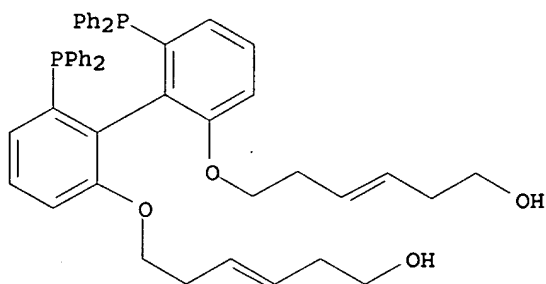
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CN Phosphine oxide, [(1S)-5,5'-dichloro-6,6'-bis(2-propenyloxy)[1,1'-biphenyl]-2,2'-diyl]bis(diphenyl- (9CI) (CA INDEX NAME)



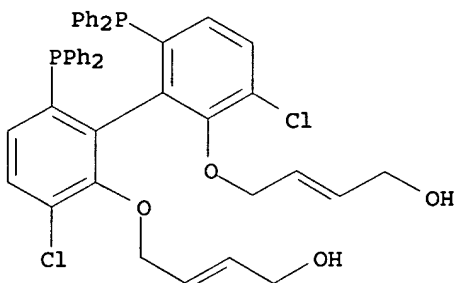
RN 810674-65-8 HCAPLUS

CN 3-Hexen-1-ol, 6,6'-[[[(1S)-6,6'-bis(diphenylphosphino)[1,1'-biphenyl]-2,2'-diyl]bis(oxy)]bis-, (3Z,3'Z)- (9CI) (CA INDEX NAME)



RN 810674-66-9 HCAPLUS

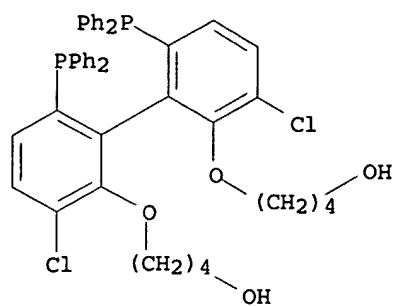
CN 2-Buten-1-ol, 4,4'-[[[(1S)-3,3'-dichloro-6,6'-bis(diphenylphosphino)[1,1'-biphenyl]-2,2'-diyl]bis(oxy)]bis-, (2Z,2'Z)- (9CI) (CA INDEX NAME)



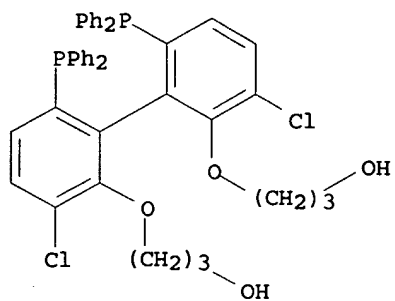
RN 810674-70-5 HCAPLUS

CN 1-Butanol, 4,4'-[[[(1S)-3,3'-dichloro-6,6'-bis(diphenylphosphino)[1,1'-biphenyl]-2,2'-diyl]bis(oxy)]bis- (9CI) (CA INDEX NAME)



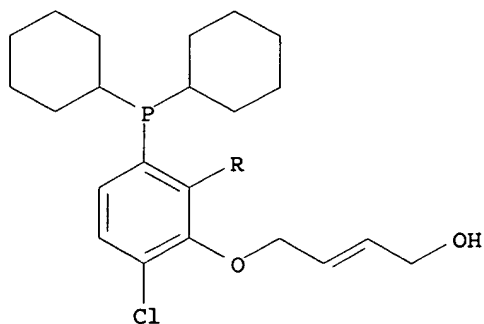


RN 810674-71-6 HCAPLUS  
 CN 1-Propanol, 3,3'-[[[(1S)-3,3'-dichloro-6,6'-bis(diphenylphosphino)[1,1'-biphenyl]-2,2'-diyl]bis(oxy)]bis- (9CI)  
 (CA INDEX NAME)

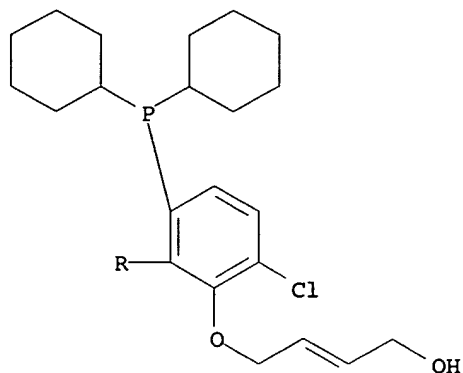


RN 810674-72-7 HCAPLUS  
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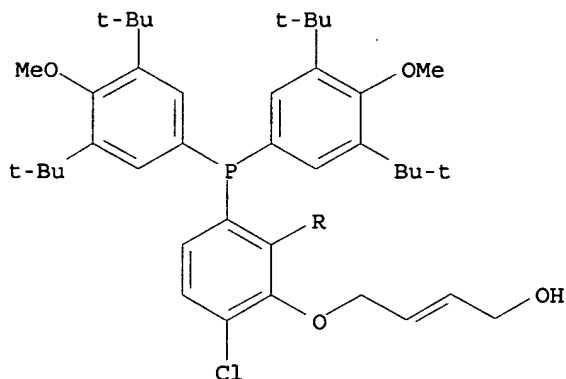


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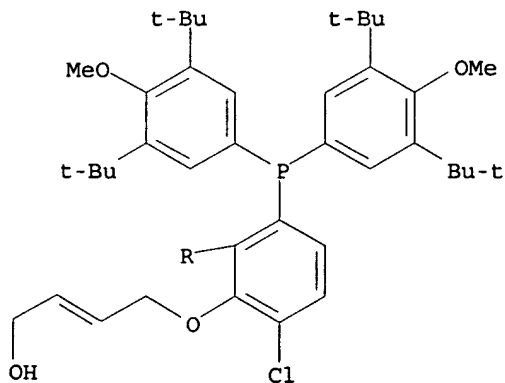


RN 810674-73-8 HCAPLUS  
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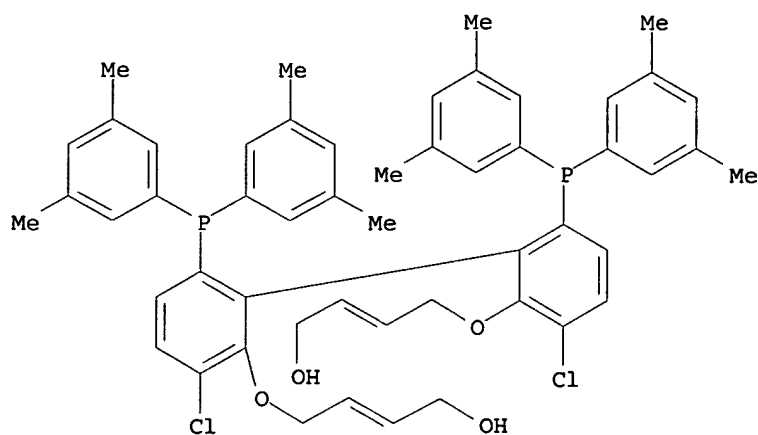


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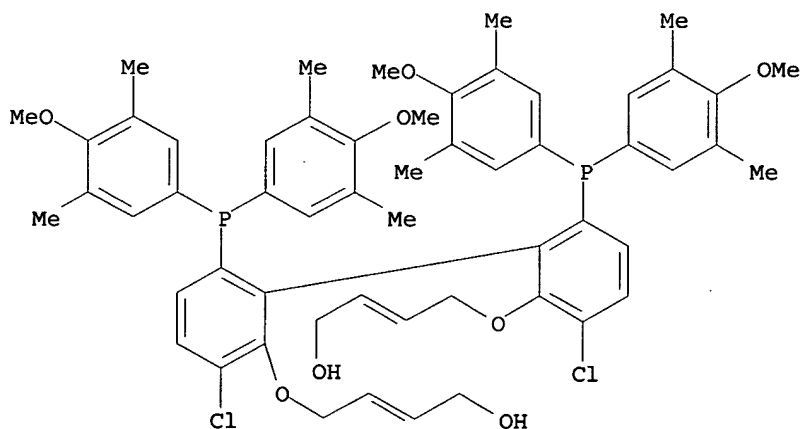


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(9CI) (CA INDEX NAME)

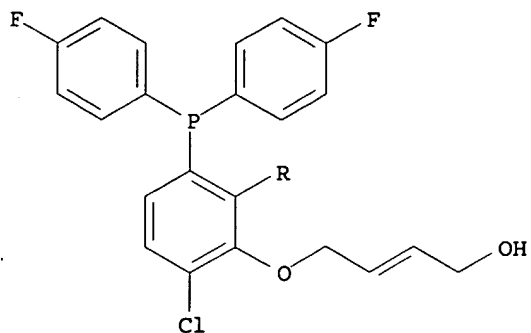


RN 810674-75-0 HCAPLUS  
CN 2-Buten-1-ol, 4,4'-[[[(1R)-6,6'-bis[bis(4-methoxy-3,5-dimethylphenyl)phosphino]-3,3'-dichloro[1,1'-biphenyl]-2,2'-diyl]bis(oxy)]bis-, (2Z,2'Z)- (9CI) (CA INDEX NAME)

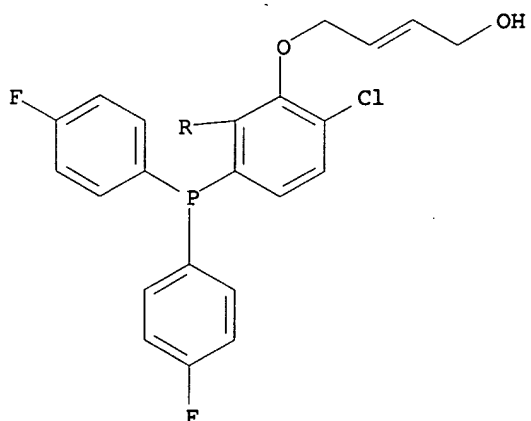


RN 810674-76-1 HCAPLUS  
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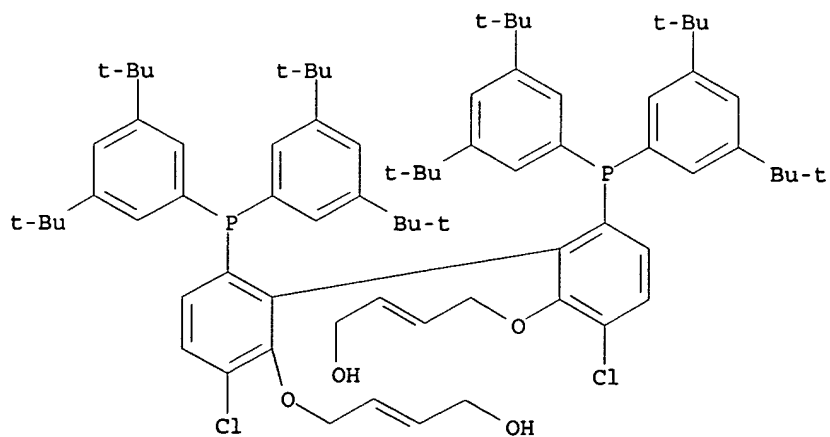
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PAGE 2-A

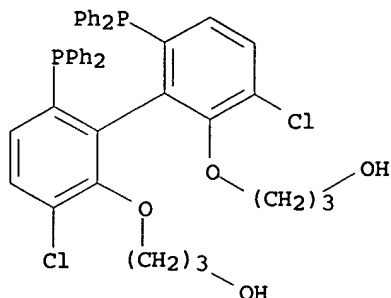


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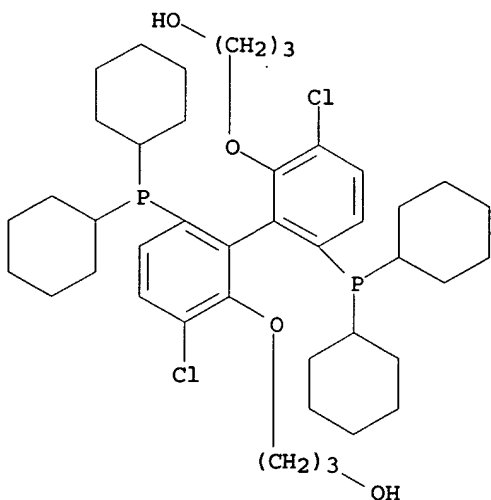


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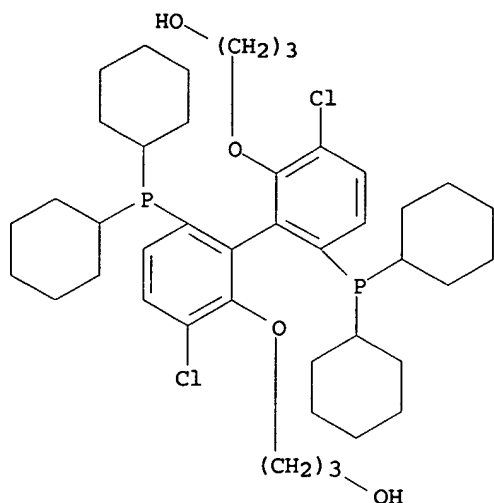
CN 1-Propanol, 3,3'-[[[(1R)-3,3'-dichloro-6,6'-bis(diphenylphosphino)[1,1'-biphenyl]-2,2'-diyl]bis(oxy)]bis- (9CI)  
(CA INDEX NAME)



RN 810674-79-4 HCAPLUS  
CN 1-Propanol, 3,3'-[[[(1R)-3,3'-dichloro-6,6'-bis(dicyclohexylphosphino)[1,1'-biphenyl]-2,2'-diyl]bis(oxy)]bis- (9CI) (CA INDEX NAME)

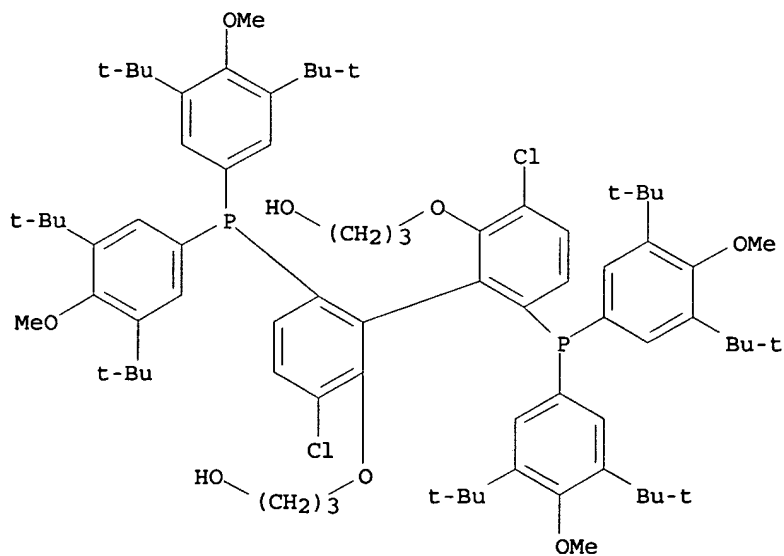


RN 810674-80-7 HCAPLUS  
CN 1-Propanol, 3,3'-[[[(1S)-3,3'-dichloro-6,6'-bis(dicyclohexylphosphino)[1,1'-biphenyl]-2,2'-diyl]bis(oxy)]bis- (9CI) (CA INDEX NAME)



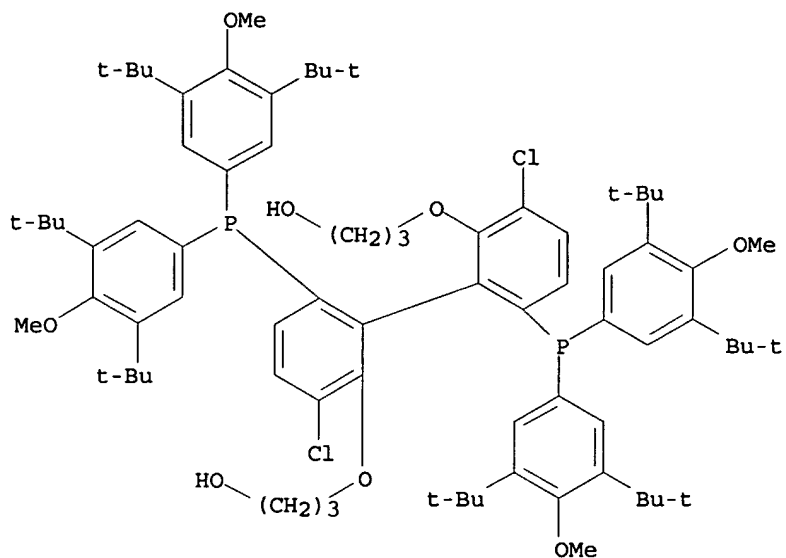
RN 810674-81-8 HCAPLUS

CN 1-Propanol, 3,3'-[[[(1R)-6,6'-bis[bis[3,5-bis(1,1-dimethylethyl)-4-methoxyphenyl]phosphino]-3,3'-dichloro[1,1'-biphenyl]-2,2'-diyl]bis(oxy)]bis- (9CI) (CA INDEX NAME)

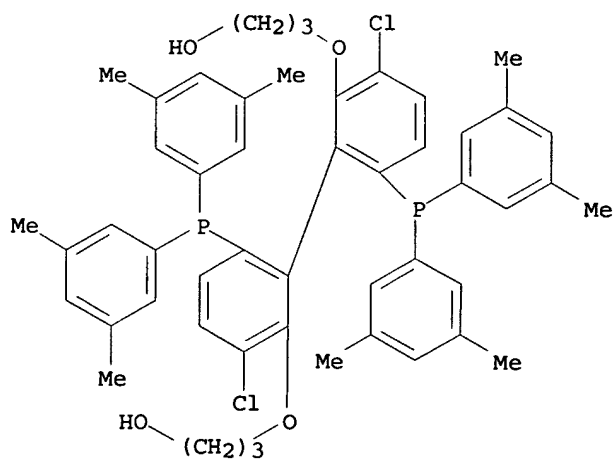


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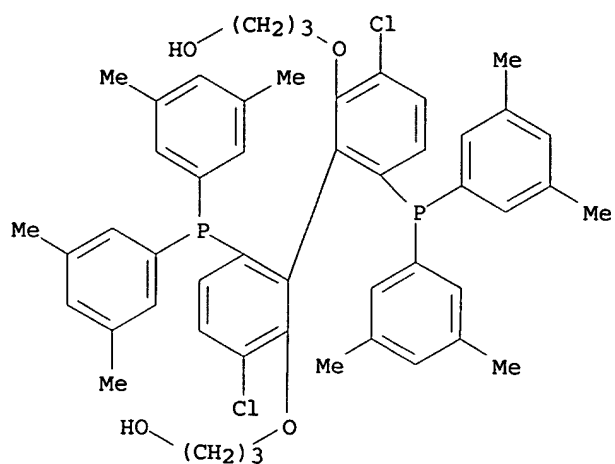
CN 1-Propanol, 3,3'-[[[(1S)-6,6'-bis[bis[3,5-bis(1,1-dimethylethyl)-4-methoxyphenyl]phosphino]-3,3'-dichloro[1,1'-biphenyl]-2,2'-diyl]bis(oxy)]bis- (9CI) (CA INDEX NAME)



RN 810674-83-0 HCAPLUS  
 CN 1-Propanol, 3,3'-[[[(1R)-6,6'-bis[bis(3,5-dimethylphenyl)phosphino]-  
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 INDEX NAME)

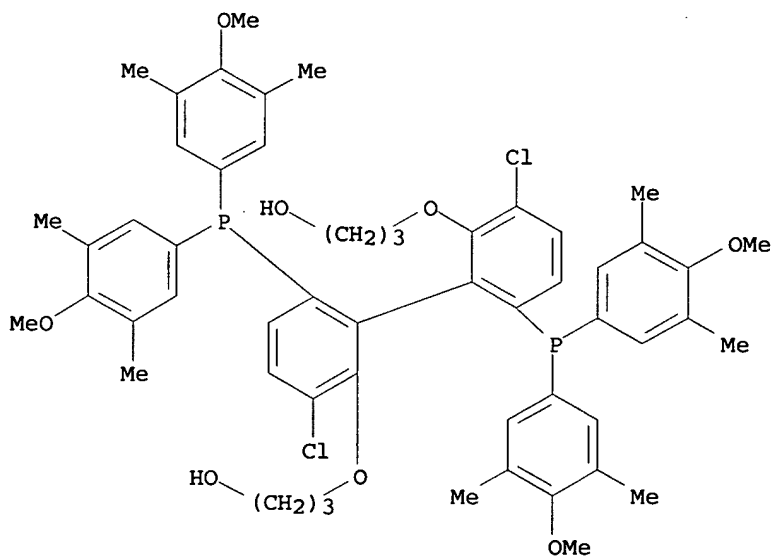


RN 810674-84-1 HCAPLUS  
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 INDEX NAME)



RN 810674-85-2 HCAPLUS

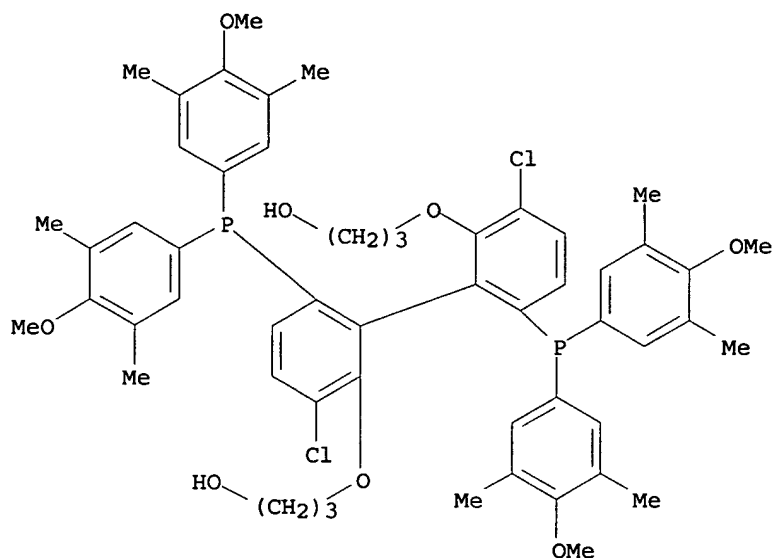
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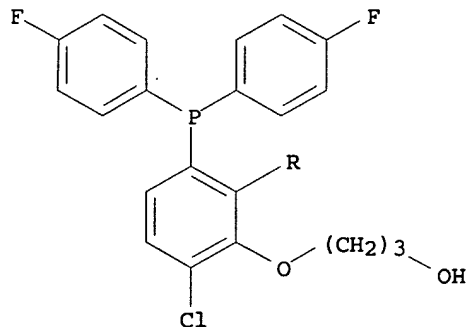
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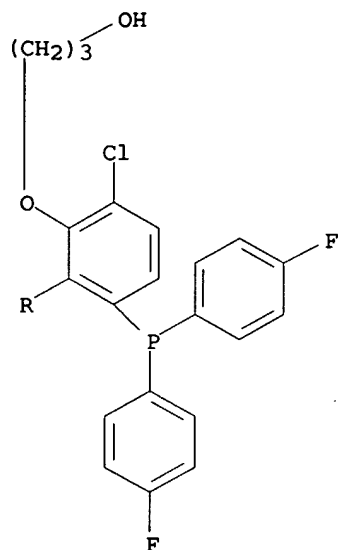


RN 810674-87-4 HCAPLUS  
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 NAME)

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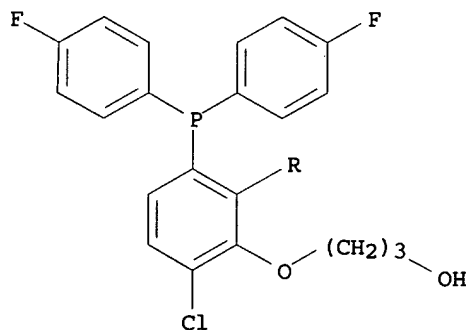


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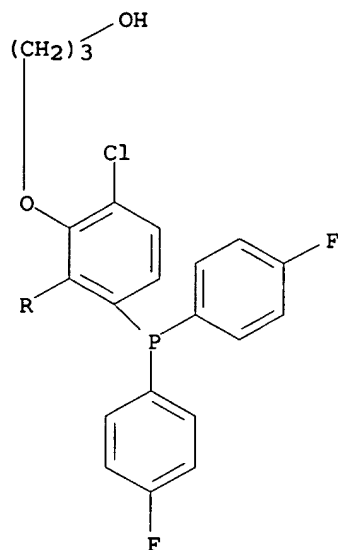


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 NAME)

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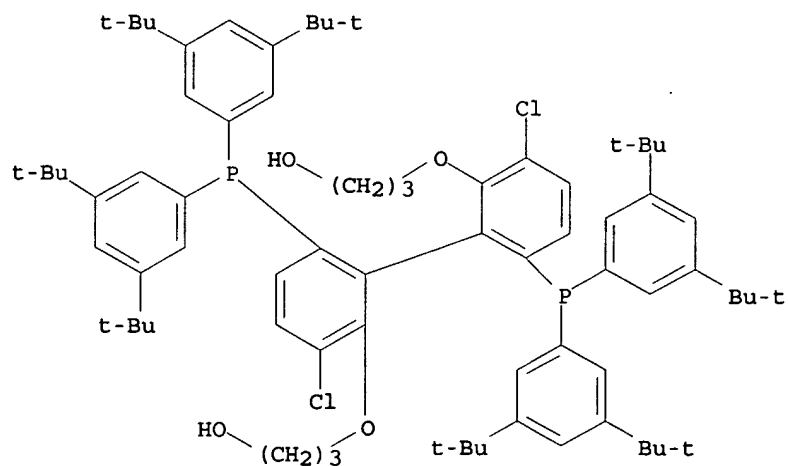


PAGE 2-A



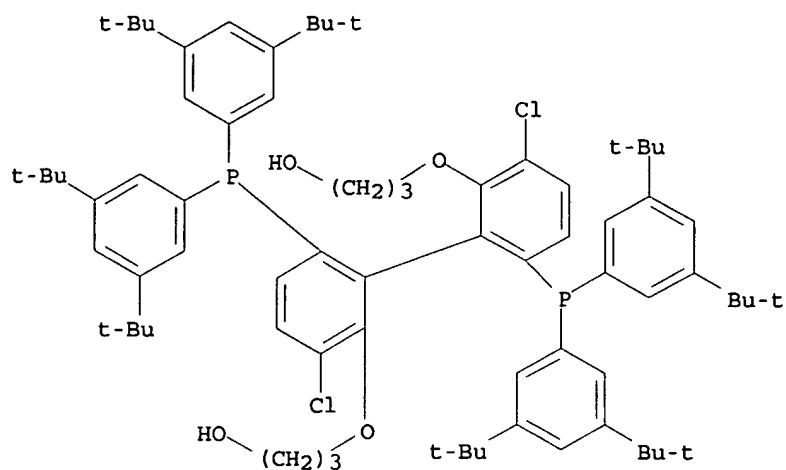
RN 810674-89-6 HCAPLUS

CN 1-Propanol, 3,3'-[[[(1R)-6,6'-bis[bis[3,5-bis(1,1-dimethylethyl)phenyl]phosphino]-3,3'-dichloro[1,1'-biphenyl]-2,2'-diyl]bis(oxy)]bis- (9CI) (CA INDEX NAME)



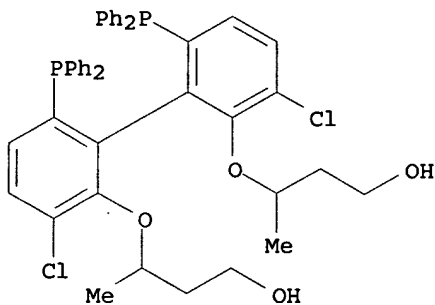
RN 810674-90-9 HCAPLUS

CN 1-Propanol, 3,3'-[[[(1S)-6,6'-bis[bis[3,5-bis(1,1-dimethylethyl)phenyl]phosphino]-3,3'-dichloro[1,1'-biphenyl]-2,2'-diyl]bis(oxy)]bis- (9CI) (CA INDEX NAME)



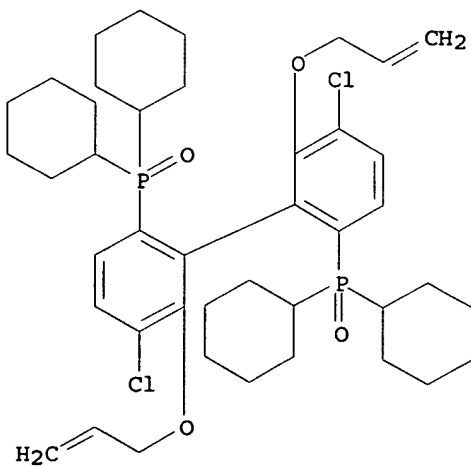
RN 810674-91-0 HCAPLUS

CN 1-Butanol, 3,3'-[[[(1R)-3,3'-dichloro-6,6'-bis(diphenylphosphino) [1,1'-biphenyl]-2,2'-diyl]bis(oxy)]bis- (9CI)  
(CA INDEX NAME)



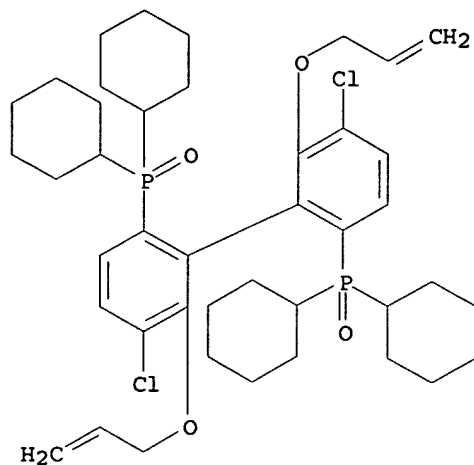
RN 810674-92-1 HCAPLUS

CN Phosphine oxide, [(1R)-5,5'-dichloro-6,6'-bis(2-propenyloxy) [1,1'-biphenyl]-2,2'-diyl]bis[dicyclohexyl- (9CI) (CA INDEX NAME)



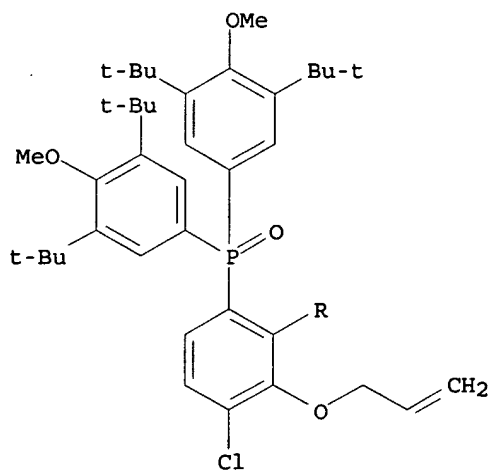
RN 810674-93-2 HCAPLUS

CN Phosphine oxide, [(1S)-5,5'-dichloro-6,6'-bis(2-propenyloxy) [1,1'-biphenyl]-2,2'-diyl]bis[dicyclohexyl- (9CI) (CA INDEX NAME)]



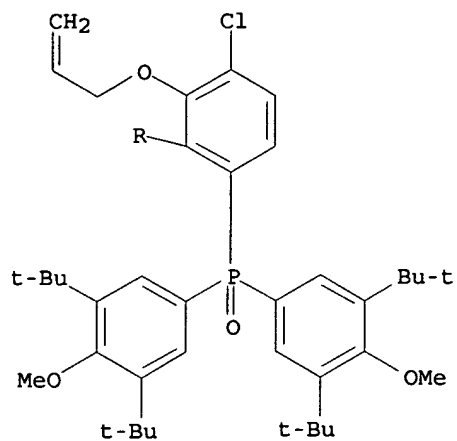
RN 810674-94-3 HCAPLUS

CN Phosphine oxide, [(1R)-5,5'-dichloro-6,6'-bis(2-propenyloxy) [1,1'-biphenyl]-2,2'-diyl]bis[bis[3,5-bis(1,1-dimethylethyl)-4-methoxyphenyl]- (9CI) (CA INDEX NAME)]



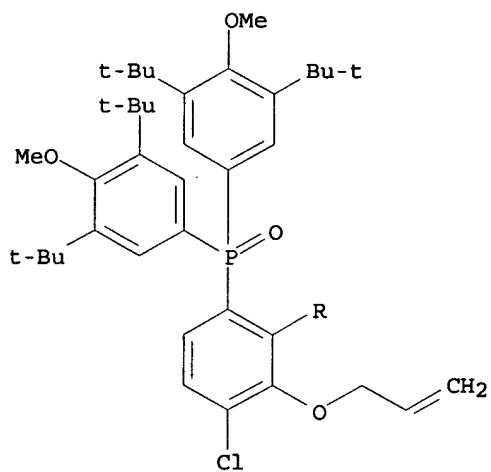
PAGE 1-A

PAGE 2-A

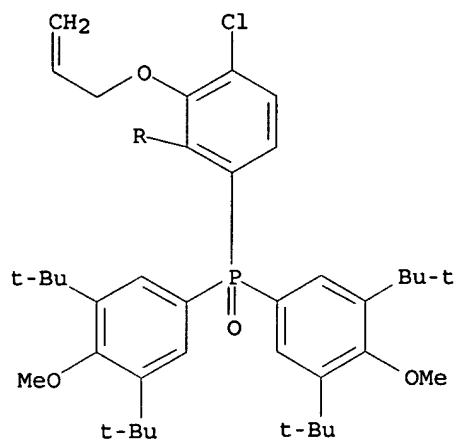


RN 810674-95-4 HCAPLUS  
 CN Phosphine oxide, [(1S)-5,5'-dichloro-6,6'-bis(2-propenyloxy) [1,1'-biphenyl]-2,2'-diyl]bis[bis[3,5-bis(1,1-dimethylethyl)-4-methoxyphenyl]- (9CI) (CA INDEX NAME)

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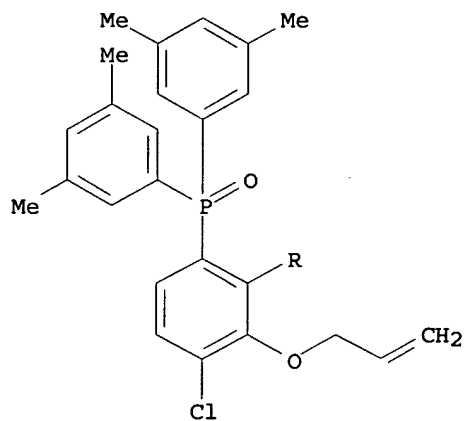


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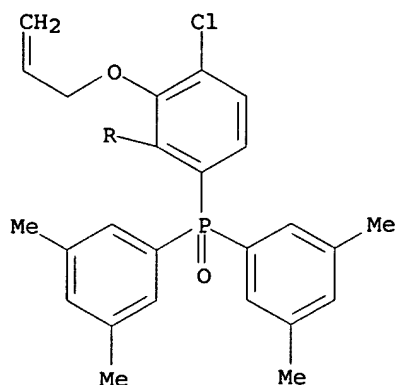


RN 810674-96-5 HCAPLUS  
 CN Phosphine oxide, [(1R)-5,5'-dichloro-6,6'-bis(2-propenyloxy) [1,1'-biphenyl]-2,2'-diyl]bis[bis(3,5-dimethylphenyl)- (9CI) (CA INDEX NAME)]

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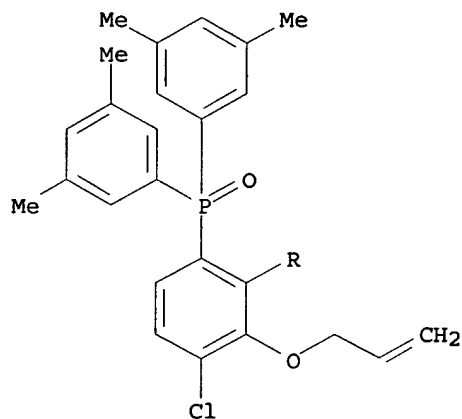


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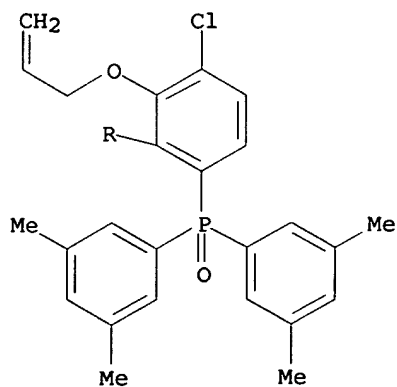


RN 810674-97-6 HCAPLUS  
CN Phosphine oxide, [(1S)-5,5'-dichloro-6,6'-bis(2-propenyloxy)[1,1'-biphenyl]-2,2'-diyl]bis[bis(3,5-dimethylphenyl)-(9CI) (CA INDEX NAME)]

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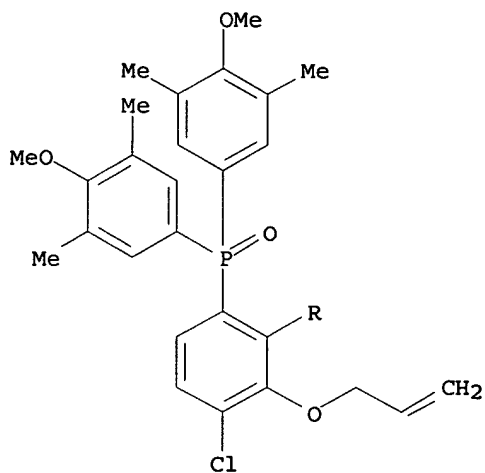
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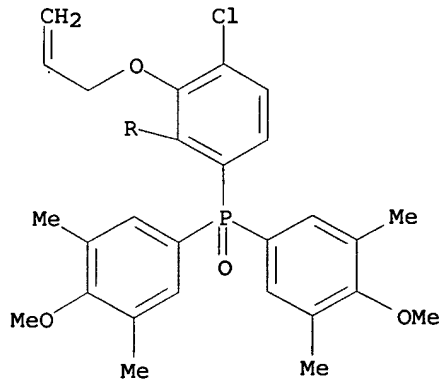


RN 810674-98-7 HCAPLUS  
 CN Phosphine oxide, [(1R)-5,5'-dichloro-6,6'-bis(2-propenyloxy) [1,1'-biphenyl]-2,2'-diyl]bis[bis(4-methoxy-3,5-dimethylphenyl)- (9CI)  
 (CA INDEX NAME)

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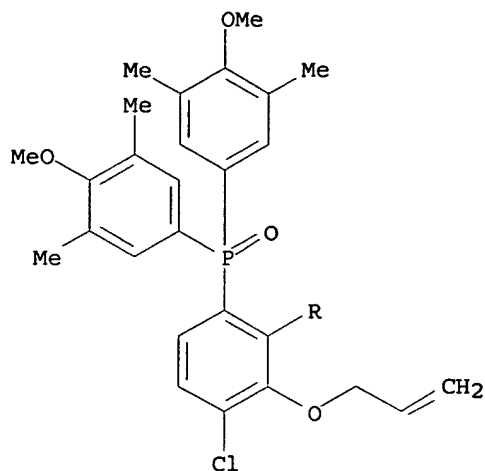


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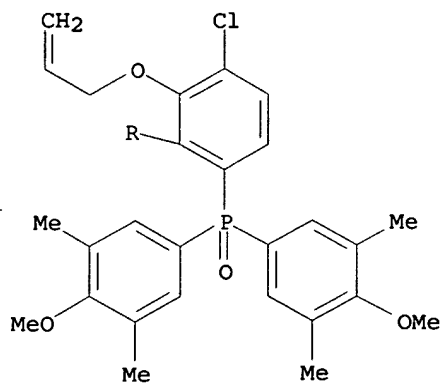


RN 810674-99-8 HCAPLUS  
 CN Phosphine oxide, [(1S)-5,5'-dichloro-6,6'-bis(2-propenyloxy) [1,1'-biphenyl]-2,2'-diyl]bis[bis(4-methoxy-3,5-dimethylphenyl)- (9CI)  
 (CA INDEX NAME)

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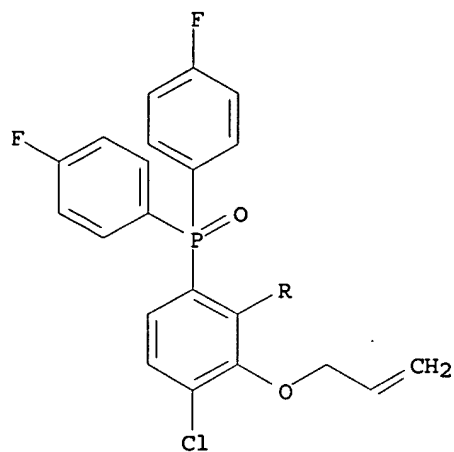


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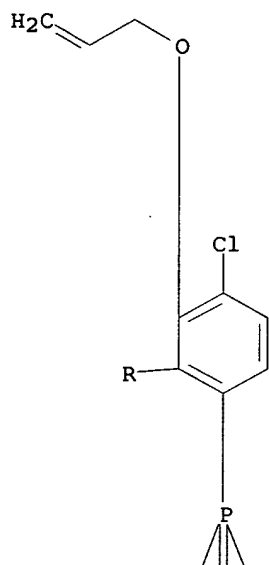


RN 810675-00-4 HCAPLUS  
 CN Phosphine oxide, [(1R)-5,5'-dichloro-6,6'-bis(2-propenyloxy)[1,1'-biphenyl]-2,2'-diyl]bis[bis(4-fluorophenyl)-(9CI) (CA INDEX NAME)]

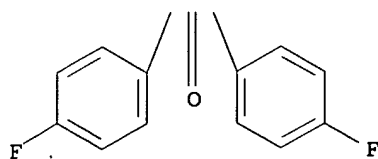
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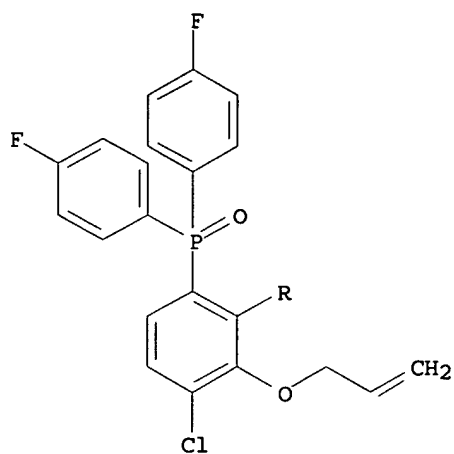


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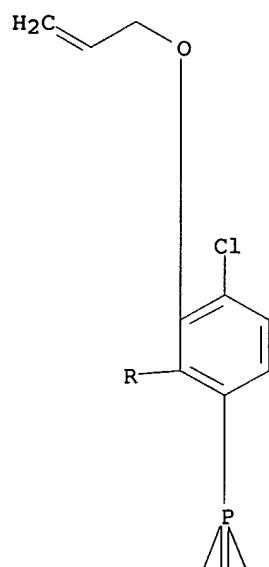


RN 810675-01-5 HCAPLUS  
 CN Phosphine oxide, [(1S)-5,5'-dichloro-6,6'-bis(2-propenyloxy) [1,1'-biphenyl]-2,2'-diyl]bis[bis(4-fluorophenyl)- (9CI) (CA INDEX NAME)

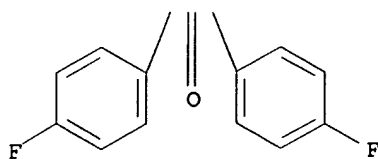
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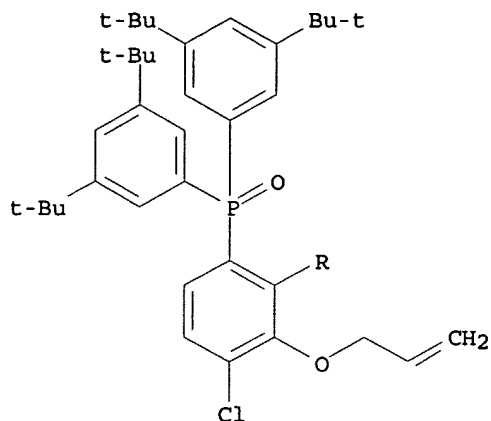
PAGE 3-A



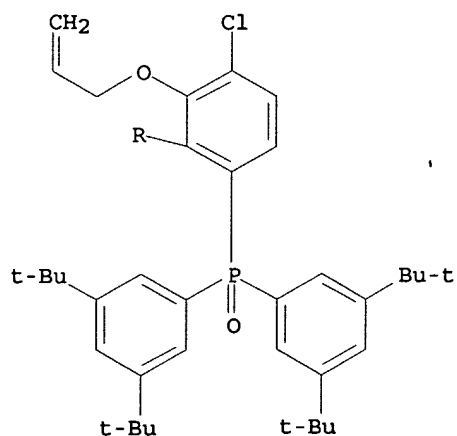
RN 810675-02-6 HCAPLUS  
 CN Phosphine oxide, [(1R)-5,5'-dichloro-6,6'-bis(2-propenyloxy) [1,1'-

biphenyl]-2,2'-diyl]bis[bis[3,5-bis(1,1-dimethylethyl)phenyl]- (9CI)  
(CA INDEX NAME)

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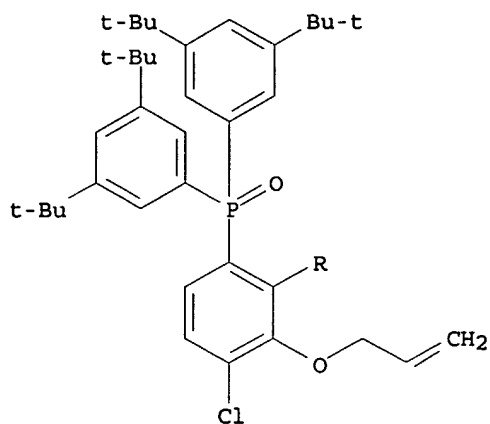


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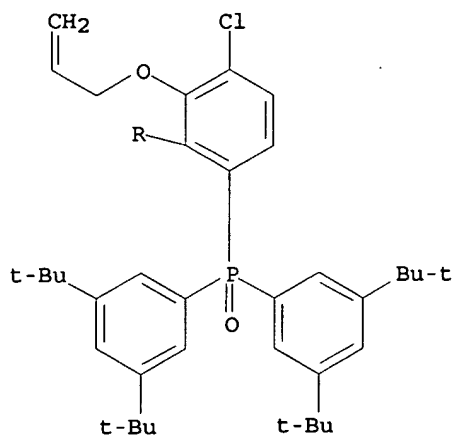


RN 810675-03-7 HCAPLUS  
CN Phosphine oxide, [(1S)-5,5'-dichloro-6,6'-bis(2-propenyloxy) [1,1'-biphenyl]-2,2'-diyl]bis[bis[3,5-bis(1,1-dimethylethyl)phenyl]- (9CI)  
(CA INDEX NAME)

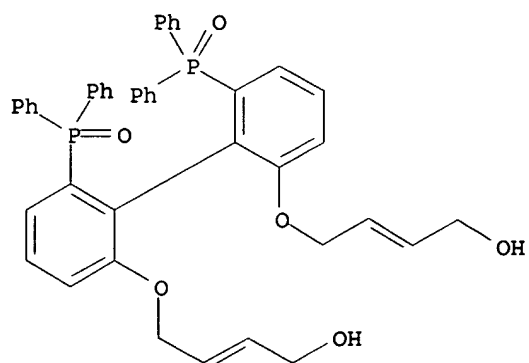
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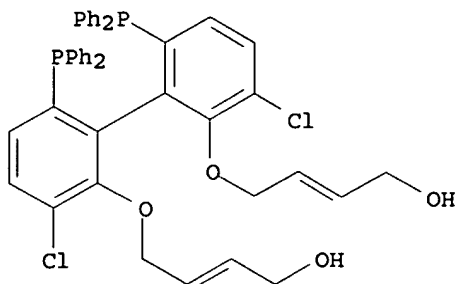


RN 810675-19-5 HCAPLUS  
 CN 2-Buten-1-ol, 4,4'-[[[(1R)-6,6'-bis(diphenylphosphinyl)[1,1'-biphenyl]-2,2'-diyl]bis(oxy)]bis-, (2Z,2'Z)- (9CI) (CA INDEX NAME)



RN 810675-20-8 HCAPLUS

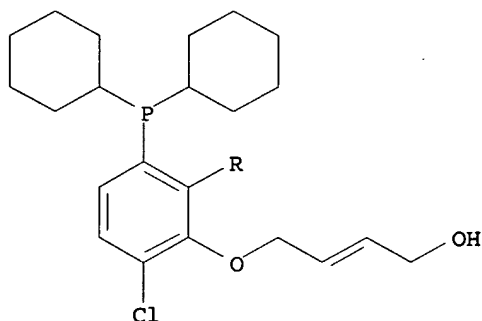
CN 2-Buten-1-ol, 4,4'-[[[(1R)-3,3'-dichloro-6,6'-bis(diphenylphosphino)[1,1'-biphenyl]-2,2'-diyl]bis(oxy)]bis-, (2Z,2'Z)- (9CI) (CA INDEX NAME)



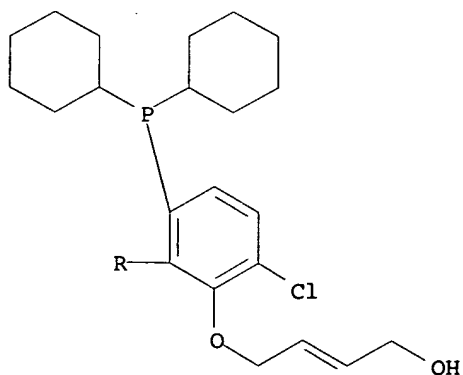
RN 810675-21-9 HCAPLUS

CN 2-Buten-1-ol, 4,4'-[[[(1S)-3,3'-dichloro-6,6'-bis(dicyclohexylphosphino)[1,1'-biphenyl]-2,2'-diyl]bis(oxy)]bis-, (2Z,2'Z)- (9CI) (CA INDEX NAME)

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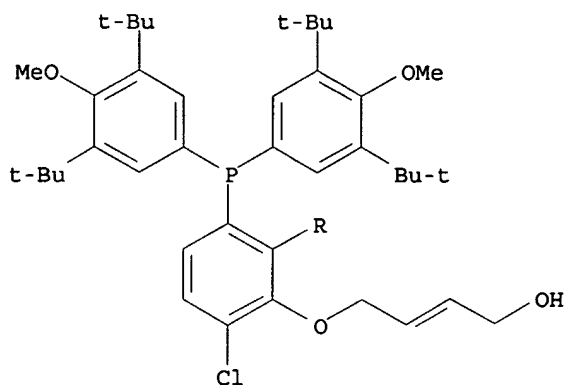
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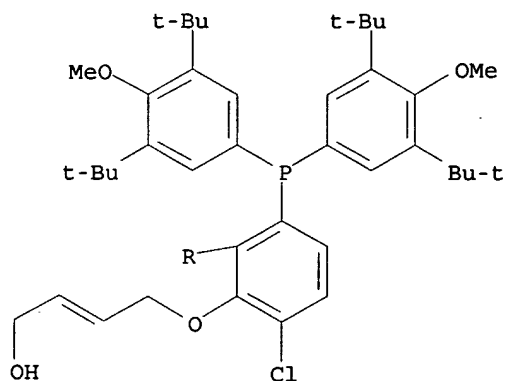
RN 810675-22-0 HCAPLUS

CN 2-Buten-1-ol, 4,4'-[[[(1S)-6,6'-bis[bis[3,5-bis(1,1-dimethylethyl)-4-methoxyphenyl]phosphino]-3,3'-dichloro[1,1'-biphenyl]-2,2'-diyl]bis(oxy)]bis-, (2Z,2'Z)- (9CI) (CA INDEX NAME)

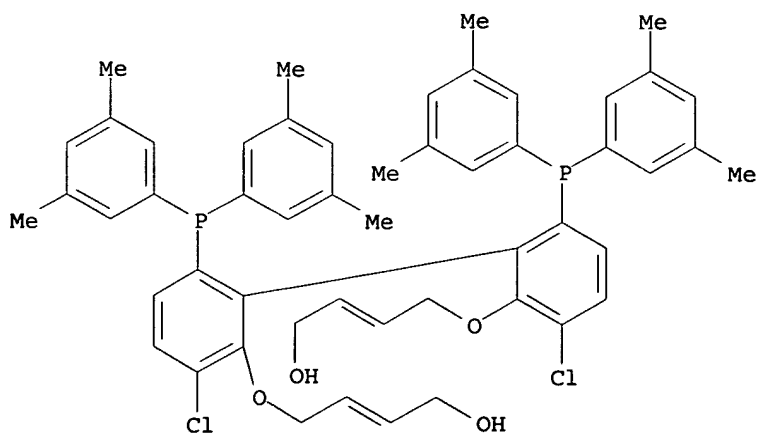
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RN 810675-23-1 HCAPLUS  
 CN 2-Buten-1-ol, 4,4'-[[[(1S)-6,6'-bis[bis(3,5-dimethylphenyl)phosphino]-3,3'-dichloro[1,1'-biphenyl]-2,2'-diyl]bis(oxy)]bis-, (2Z,2'Z)-(9CI) (CA INDEX NAME)



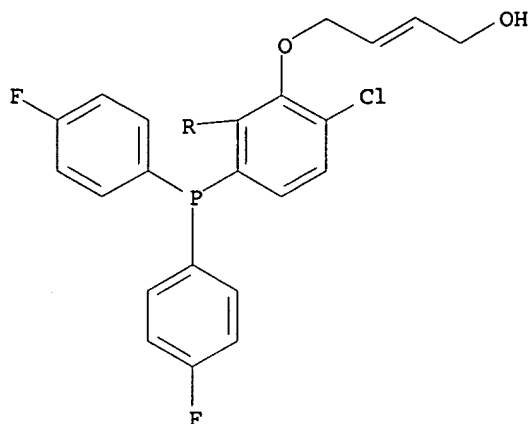
RN 810675-24-2 HCAPLUS



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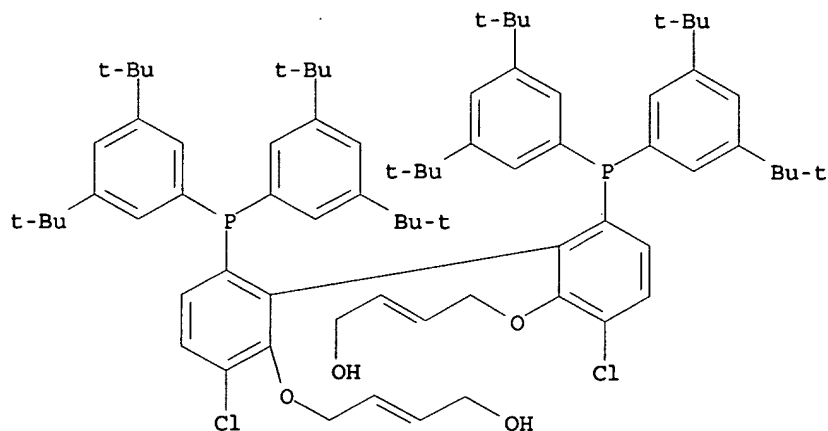
Chemical structure diagram showing a phosphorus atom (P) bonded to two 4-fluorophenyl groups and a 2-chloro-4-(3-oxopropoxy)phenyl group. The phenyl ring is substituted with a chlorine atom (Cl) at the para position, an R group at the ortho position, and a 3-oxopropoxy group (O-CH<sub>2</sub>-CH=CH<sub>2</sub>) at the other ortho position.

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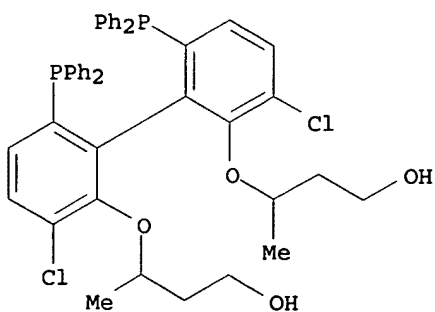
RN 810675-26-4 HCAPLUS

CN 2-Buten-1-ol, 4,4'-[[[(1S)-6,6'-bis[bis[3,5-bis(1,1-dimethylethyl)phenyl]phosphino]-3,3'-dichloro[1,1'-biphenyl]-2,2'-diyl]bis(oxy)]bis-, (2Z,2'Z)- (9CI) (CA INDEX NAME)



RN 810675-27-5 HCAPLUS

CN 1-Butanol, 3,3'-[[[(1S)-3,3'-dichloro-6,6'-bis(diphenylphosphino)[1,1'-biphenyl]-2,2'-diyl]bis(oxy)]bis- (9CI) (CA INDEX NAME)



IC ICM C07F009-53  
CC 29-7 (Organometallic and Organometalloidal  
Compounds)  
Section cross-reference(s): 21  
IT 810674-60-3P 810674-65-8P 810674-66-9P  
810674-70-5P 810674-71-6P 810674-72-7P  
810674-73-8P 810674-74-9P 810674-75-0P  
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810674-79-4P 810674-80-7P 810674-81-8P  
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810675-21-9P 810675-22-0P 810675-23-1P  
810675-24-2P 810675-25-3P 810675-26-4P  
810675-27-5P  
RL: CAT (Catalyst use); SPN (Synthetic preparation);  
PREP (Preparation); USES (Uses)  
(prepn. of biarylphosphines as chiral  
ligands for ruthenium complex catalyzed enantioselective  
hydrogenation or in asym. synthesis)

L26 ANSWER 7 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:931029 HCAPLUS

DOCUMENT NUMBER: 141:397266

TITLE: Chiral diphosphines in insoluble form, their  
preparation, and their uses as ligands in the  
synthesis of complexes destined for asymmetric  
catalysis

INVENTOR(S): Lemaire, Marc; Berthod, Mikael

PATENT ASSIGNEE(S): Rhodia Chimie, Fr.; Centre National de la  
Recherche Scientifique CNRS.

SOURCE: Fr. Demande, 53 pp.

CODEN: FRXXBL

DOCUMENT TYPE: Patent

LANGUAGE: French

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
FR 2854401	A1	20041105	FR 2003-5253	200304 29

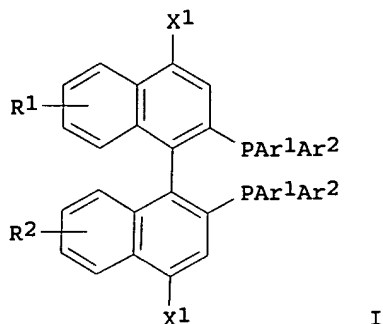
PRIORITY APPLN. INFO.:

FR 2003-5253

200304  
29

OTHER SOURCE(S): MARPAT 141:397266

GI



- AB Chiral diphosphines I (R1, R2 = H or substituent; Ar1, Ar2 = alkyl, alkenyl, cycloalkyl, aryl, or aralkyl; X1 = amino, aminomethyl, OH, HOCH2, carboxylic, ester, NCO, or OCNCH2) are polycond. with the appropriate condensation polymer-forming monomer to give optically active polymers that are able to complex with transition metals to give complexes for asym. hydrogenation catalysis. The optically active polymers are also useful for catalysts in assocn. with diamines for selective redn. of ketones. A typical catalyst, useful for hydrogenation of Et acetoacetate to Et 3-hydroxybutyrate, was manufd. by polymn. of (S)-4,4'-diaminomethylBINAP with
- IT 781646-74-0DP, ruthenium complexes 782502-73-2DP, ruthenium complexes  
 RL: CAT (Catalyst use); IMF (Industrial manufacture);  
 PREP (Preparation); USES (Uses)  
 (chiral binaphthyl diphosphines in insol. form for manuf. of optically active polycondensation polymers for manuf. of complexes with transition metals for asym. catalysis)
- RN 781646-74-0 HCAPLUS
- CN Poly[iminocarbonylimino(2-methyl-1,3-phenylene)iminocarbonyliminomet hylene[(1S)-2,2'-bis(diphenylphosphino)[1,1'-binaphthalene]-4,4'-diyl]methylene] (9CI) (CA INDEX NAME)

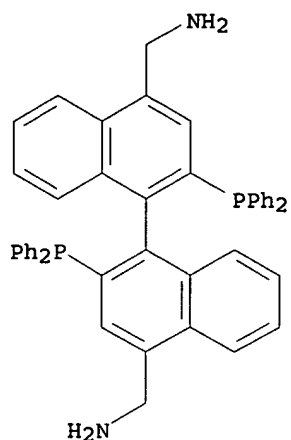
\* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT \*

\* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT \*

- RN 782502-73-2 HCAPLUS
- CN [1,1'-Binaphthalene]-4,4'-dimethanamine, 2,2'-bis(diphenylphosphino)-, (1S)-, polymer with 1,3-diisocyanato-2-methylbenzene (9CI) (CA INDEX NAME)

CM 1

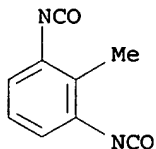
CRN 681244-49-5  
 CMF C46 H38 N2 P2



CM 2

CRN 91-08-7

CMF C9 H6 N2 O2



IT 94041-16-4P 94041-18-6P 328234-96-4P  
 681244-35-9P 681244-39-3P 681244-43-9P  
 681244-47-3P 681244-49-5P 709640-84-6P  
 709640-85-7P

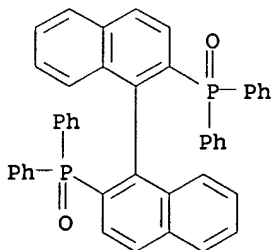
RL: IMF (Industrial manufacture); RCT (Reactant); **PREP**

(Preparation); RACT (Reactant or reagent)

(ligand precursor; chiral binaphthyl diphosphines in insol. form  
 for manuf. of optically active polycondensation polymers for  
 manuf. of complexes with transition metals for asym. catalysis)

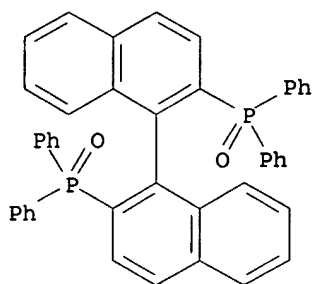
RN 94041-16-4 HCAPLUS

CN Phosphine oxide, (1R)-[1,1'-binaphthalene]-2,2'-diylbis[diphenyl-  
 (9CI) (CA INDEX NAME)



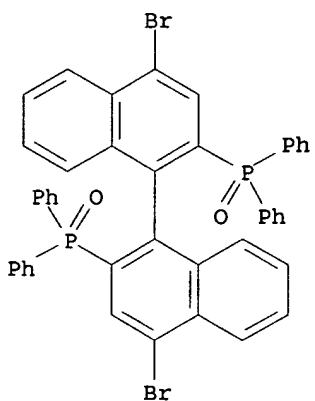
RN 94041-18-6 HCAPLUS

CN Phosphine oxide, (1S)-[1,1'-binaphthalene]-2,2'-diylbis[diphenyl-  
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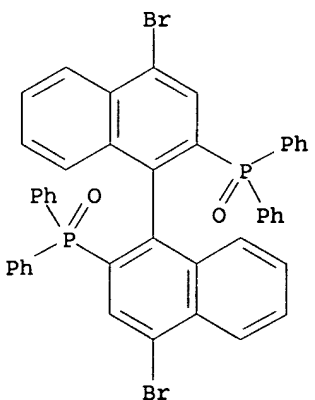
RN 328234-96-4 HCAPLUS

CN Phosphine oxide, [(1R)-4,4'-dibromo[1,1'-binaphthalene]-2,2'-diyl]bis[diphenyl- (9CI) (CA INDEX NAME)



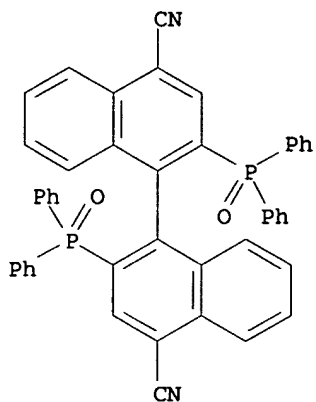
RN 681244-35-9 HCAPLUS

CN Phosphine oxide, [(1S)-4,4'-dibromo[1,1'-binaphthalene]-2,2'-diyl]bis[diphenyl- (9CI) (CA INDEX NAME)

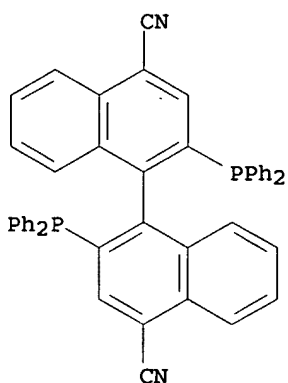


RN 681244-39-3 HCAPLUS

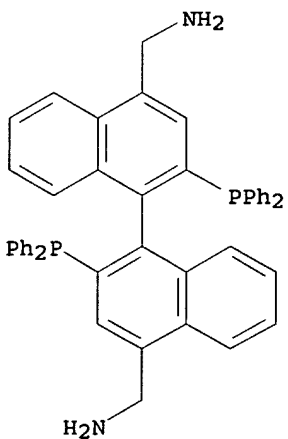
CN [1,1'-Binaphthalene]-4,4'-dicarbonitrile, 2,2'-bis(diphenylphosphinyl)-, (1S)- (9CI) (CA INDEX NAME)



RN 681244-43-9 HCAPLUS  
 CN [1,1'-Binaphthalene]-4,4'-dicarbonitrile, 2,2'-bis(diphenylphosphino)-, (1S)- (9CI) (CA INDEX NAME)

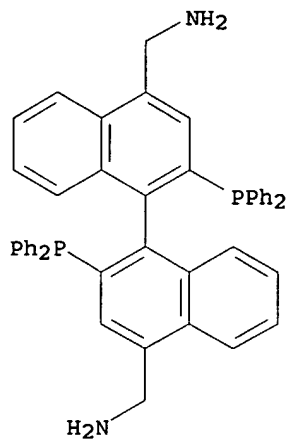


RN 681244-47-3 HCAPLUS  
 CN [1,1'-Binaphthalene]-4,4'-dimethanamine, 2,2'-bis(diphenylphosphino)-, (1R)- (9CI) (CA INDEX NAME)



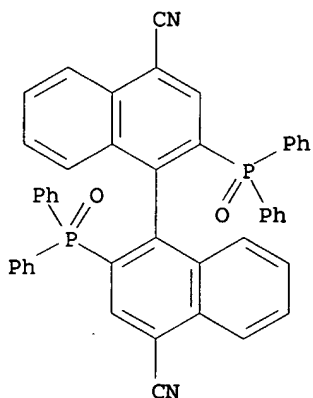
RN 681244-49-5 HCAPLUS

CN [1,1'-Binaphthalene]-4,4'-dimethanamine, 2,2'-bis(diphenylphosphino)-  
, (1S)- (9CI) (CA INDEX NAME)



RN 709640-84-6 HCAPLUS

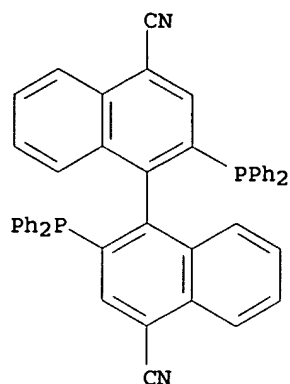
CN [1,1'-Binaphthalene]-4,4'-dicarbonitrile, 2,2'-  
bis(diphenylphosphinyl)-, (1R)- (9CI) (CA INDEX NAME)



RN 709640-85-7 HCAPLUS

CN [1,1'-Binaphthalene]-4,4'-dicarbonitrile, 2,2'-  
bis(diphenylphosphino)-, (1R)- (9CI) (CA INDEX NAME)





IT 781646-74-0P 782502-73-2P

RL: IMF (Industrial manufacture); RCT (Reactant); **PREP**

(**Preparation**); RACT (Reactant or reagent)

(ligand; chiral binaphthyl diphosphines in insol. form for manuf. of optically active polycondensation polymers for manuf. of complexes with transition metals for asym. catalysis)

RN 781646-74-0 HCAPLUS

CN Poly[iminocarbonylimino(2-methyl-1,3-phenylene)iminocarbonyliminomet  
hylene[(1S)-2,2'-bis(diphenylphosphino)[1,1'-binaphthalene]-4,4'-  
diyl]methylene] (9CI) (CA INDEX NAME)

\* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT \*

\* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT \*

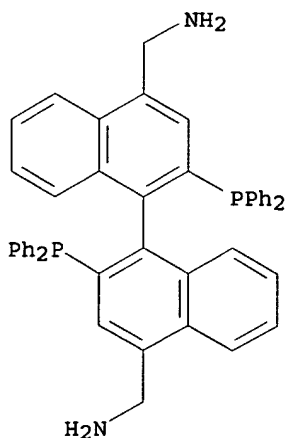
RN 782502-73-2 HCAPLUS

CN [1,1'-Binaphthalene]-4,4'-dimethanamine, 2,2'-bis(diphenylphosphino)-  
, (1S)-, polymer with 1,3-diisocyanato-2-methylbenzene (9CI) (CA  
INDEX NAME)

CM 1

CRN 681244-49-5

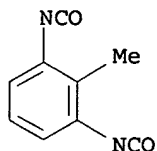
CMF C46 H38 N2 P2



CM 2

CRN 91-08-7

CMF C9 H6 N2 O2



- IC ICM C07F009-50  
ICS C07B053-00; C08G071-02
- CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)  
Section cross-reference(s): 23, 29, 35, 67, 78
- IT Transition metal complexes  
RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP  
(Preparation); USES (Uses)  
(chiral binaphthyl diphosphines in insol. form for manuf. of optically active polycondensation polymers for manuf. of complexes with transition metals for asym. catalysis)
- IT Amines, preparation  
RL: IMF (Industrial manufacture); RCT (Reactant); PREP  
(Preparation); RACT (Reactant or reagent)  
(diamines, ligand precursors; chiral binaphthyl diphosphines in insol. form for manuf. of optically active polycondensation polymers for manuf. of complexes with transition metals for asym. catalysis)
- IT Carboxylic acids, preparation  
RL: IMF (Industrial manufacture); RCT (Reactant); PREP  
(Preparation); RACT (Reactant or reagent)  
(dicarboxylic, ligand precursors; chiral binaphthyl diphosphines in insol. form for manuf. of optically active polycondensation polymers for manuf. of complexes with transition metals for asym. catalysis)
- IT Esters, preparation  
RL: IMF (Industrial manufacture); RCT (Reactant); PREP  
(Preparation); RACT (Reactant or reagent)  
(diesters, ligand precursors; chiral binaphthyl diphosphines in insol. form for manuf. of optically active polycondensation polymers for manuf. of complexes with transition metals for asym. catalysis)
- IT Glycols, preparation  
RL: IMF (Industrial manufacture); RCT (Reactant); PREP  
(Preparation); RACT (Reactant or reagent)  
(ligand precursors; chiral binaphthyl diphosphines in insol. form for manuf. of optically active polycondensation polymers for manuf. of complexes with transition metals for asym. catalysis)
- IT Polyamides, preparation  
Polyesters, preparation  
Polyimides, preparation  
Polyureas  
Polyurethanes, preparation  
RL: IMF (Industrial manufacture); RCT (Reactant); PREP  
(Preparation); RACT (Reactant or reagent)  
(ligands; chiral binaphthyl diphosphines in insol. form for manuf. of optically active polycondensation polymers for manuf. of complexes with transition metals for asym. catalysis)
- IT 7439-88-5DP, Iridium, complexes with chiral diphosphinobinaphthyl-

contg. polymers 7440-02-ODP, Nickel, complexes with chiral diphosphinobinaphthyl-contg. polymers 7440-05-3DP, Palladium, complexes with chiral diphosphinobinaphthyl-contg. polymers 7440-06-4DP, Platinum, complexes with chiral diphosphinobinaphthyl-contg. polymers 7440-15-5DP, Rhenium, complexes with chiral diphosphinobinaphthyl-contg. polymers 7440-16-6DP, Rhodium, complexes with chiral diphosphinobinaphthyl-contg. polymers 7440-18-8DP, Ruthenium, complexes with diaminomethylBINAP-diisocyanatotoluene copolymer 7440-48-4DP, Cobalt, complexes with chiral diphosphinobinaphthyl-contg. polymers 781646-74-ODP, ruthenium complexes 782502-73-2DP, ruthenium complexes

RL: CAT (Catalyst use); IMF (Industrial manufacture);

PREP (Preparation); USES (Uses)

(chiral binaphthyl diphosphines in insol. form for manuf. of optically active polycondensation polymers for manuf. of complexes with transition metals for asym. catalysis)

IT 5700-60-7, 1,2-Diamino-1,2-diphenylethane

RL: CAT (Catalyst use); USES (Uses)

(ketone redn. cocatalyst; chiral binaphthyl diphosphines in insol. form for manuf. of optically active polycondensation polymers for manuf. of complexes with transition metals for asym. catalysis)

IT 94041-16-4P 94041-18-6P 328234-96-4P

681244-35-9P 681244-39-3P 681244-43-9P

681244-47-3P 681244-49-5P 709640-84-6P

709640-85-7P

RL: IMF (Industrial manufacture); RCT (Reactant); PREP

(Preparation); RACT (Reactant or reagent)

(ligand precursor; chiral binaphthyl diphosphines in insol. form for manuf. of optically active polycondensation polymers for manuf. of complexes with transition metals for asym. catalysis)

IT 781646-74-0P 782502-73-2P

RL: IMF (Industrial manufacture); RCT (Reactant); PREP

(Preparation); RACT (Reactant or reagent)

(ligand; chiral binaphthyl diphosphines in insol. form for manuf. of optically active polycondensation polymers for manuf. of complexes with transition metals for asym. catalysis)

REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L26 ANSWER 8 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:847213 HCAPLUS

DOCUMENT NUMBER: 141:350269

TITLE: Water-soluble chiral diphosphines and their uses as ligands on transition-metal catalysts for asymmetric synthesis

INVENTOR(S): Lemaire, Marc; Saluzzo, Christine; Berthod, Mikael

PATENT ASSIGNEE(S): Rhodia Chimie, Fr.; Centre National de la Recherche Scientifique CNRS

SOURCE: Fr. Demande, 64 pp.

CODEN: FRXXBL

DOCUMENT TYPE: Patent

LANGUAGE: French

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
FR 2853652	A1	20041015	FR 2003-4391	20030409

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PRIORITY APPLN. INFO.:

FR 2003-4391

200304

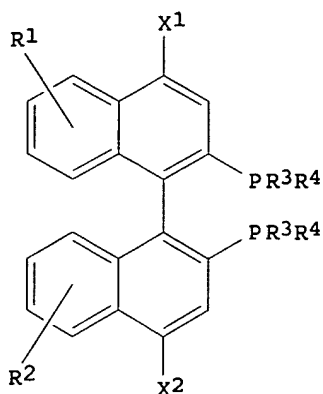
09

OTHER SOURCE(S):

MARPAT 141:350269

&lt;--

GI



AB Racemic or optically active, water-sol., 4,4'-disubstituted binaphthyl-derived diphosphines (I; R1, R2 = H, substituent; R3, R4 = alkyl, alkenyl, cycloalkyl, aryl, arylalkyl; X1, X2 = H or water-sol. group such as ammonium, guanidinium, amino modified by linear polyoxyalkylene chain, carboxylate; at most 1 of X1 or X2 = H, at least 1 of X1 or X2 = cited functional groups), useful as ligands on transition-metal catalysts, preferably Rh, Ru, or Ir, for asym. synthesis, preferably asym. hydrogenation, are claimed. The substituents in the 4,4'-positions are chosen to ensure a better soly. in aq. phase. Thus, hydrogenation of MeCOCH2CO2Et in presence of dibromoruthenium catalysts contg. an (R)- or (S)-I (R1 = R2 = H, R3 = R4 = Ph, X1 = X2 = CH2N+H3 Br-; prepn. given) gave MeCH(OH)CH2CO2Et in 100% conversions and 97-100% ee in many cases.

IT 681234-83-3P 774583-52-7P

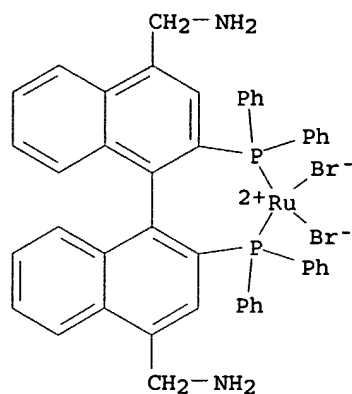
RL: CAT (Catalyst use); SPN (Synthetic preparation);

PREP (Preparation); USES (Uses)

(prepn. of water-sol. chiral diphosphines and their transition-metal complexes, and use of the complexes as catalysts for asym. synthesis)

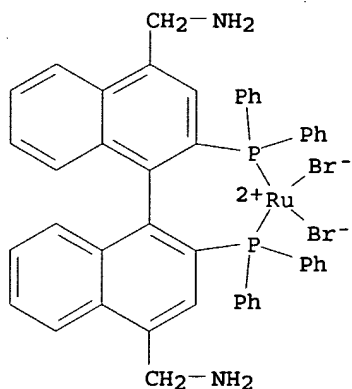
RN 681234-83-3 HCAPLUS

CN Ruthenium, [(1R)-2,2'-bis(diphenylphosphino-κP)[1,1'-binaphthalene]-4,4'-dimethanamine]dibromo-, dihydrobromide, (SP-4-2)- (9CI) (CA INDEX NAME)



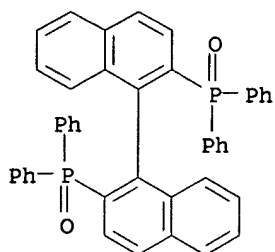
● 2 HBr

RN 774583-52-7 HCAPLUS  
 CN Ruthenium, [(1S)-2,2'-bis(diphenylphosphino-κP)[1,1'-binaphthalene]-4,4'-dimethanamine]dibromo-, dihydrobromide, (SP-4-2)- (9CI) (CA INDEX NAME)

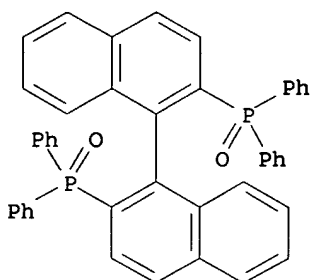


● 2 HBr

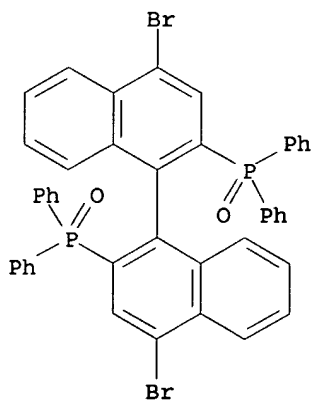
IT 94041-16-4P 94041-18-6P 328234-96-4P  
 681244-35-9P 681244-39-3P 681244-43-9P  
 681244-47-3P 681244-49-5P 709640-84-6P  
 709640-85-7P 774583-43-6P 774583-54-9P  
 RL: RCT (Reactant); SPN (Synthetic preparation); **PREP**  
 (**Preparation**); RACT (Reactant or reagent)  
 (prepn. of water-sol. chiral diphosphines and their  
 transition-metal complexes, and use of the complexes as catalysts  
 for asym. synthesis)  
 RN 94041-16-4 HCAPLUS  
 CN Phosphine oxide, (1R)-[1,1'-binaphthalene]-2,2'-diylbis[diphenyl-  
 (9CI) (CA INDEX NAME)



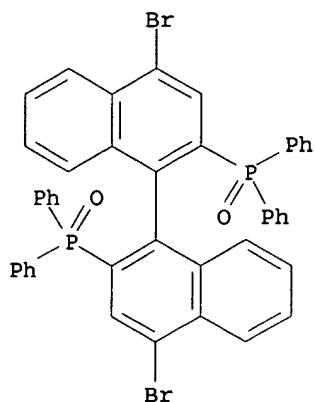
RN 94041-18-6 HCAPLUS  
 CN Phosphine oxide, (1S)-[1,1'-binaphthalene]-2,2'-diylbis[diphenyl-  
 (9CI) (CA INDEX NAME)



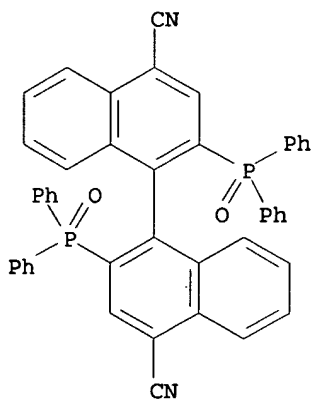
RN 328234-96-4 HCAPLUS  
 CN Phosphine oxide, [(1R)-4,4'-dibromo[1,1'-binaphthalene]-2,2'-  
 diyl]bis[diphenyl- (9CI) (CA INDEX NAME)



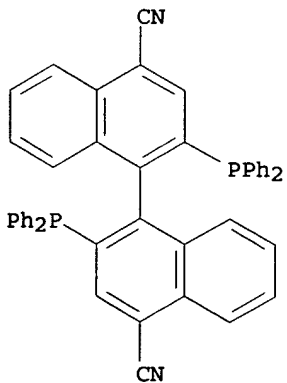
RN 681244-35-9 HCAPLUS  
 CN Phosphine oxide, [(1S)-4,4'-dibromo[1,1'-binaphthalene]-2,2'-  
 diyl]bis[diphenyl- (9CI) (CA INDEX NAME)



RN 681244-39-3 HCAPLUS  
 CN [1,1'-Binaphthalene]-4,4'-dicarbonitrile, 2,2'-bis(diphenylphosphino)-, (1S)- (9CI) (CA INDEX NAME)

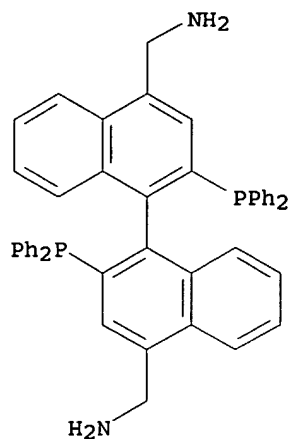


RN 681244-43-9 HCAPLUS  
 CN [1,1'-Binaphthalene]-4,4'-dicarbonitrile, 2,2'-bis(diphenylphosphino)-, (1S)- (9CI) (CA INDEX NAME)



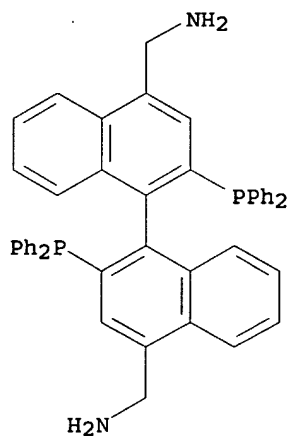
RN 681244-47-3 HCAPLUS  
 CN [1,1'-Binaphthalene]-4,4'-dimethanamine, 2,2'-bis(diphenylphosphino)-

, (1R) - (9CI) (CA INDEX NAME)



RN 681244-49-5 HCAPLUS

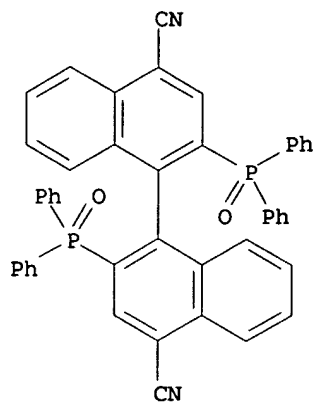
CN [1,1'-Binaphthalene]-4,4'-dimethanamine, 2,2'-bis(diphenylphosphino)-  
, (1S) - (9CI) (CA INDEX NAME)



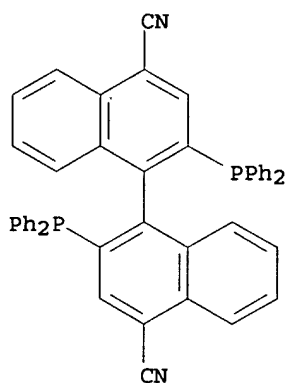
RN 709640-84-6 HCAPLUS

CN [1,1'-Binaphthalene]-4,4'-dicarbonitrile, 2,2'-  
bis(diphenylphosphino)-, (1R) - (9CI) (CA INDEX NAME)

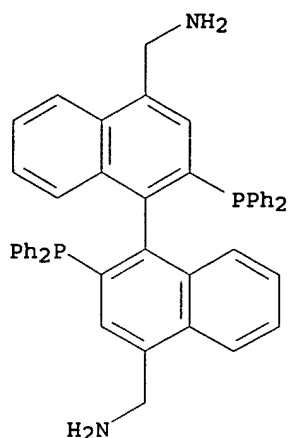




RN 709640-85-7 HCAPLUS  
 CN [1,1'-Binaphthalene]-4,4'-dicarbonitrile, 2,2'-bis(diphenylphosphino)-, (1R)- (9CI) (CA INDEX NAME)



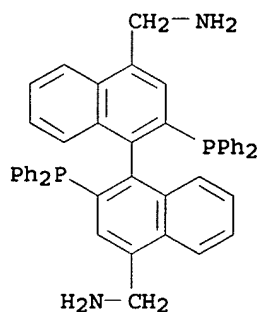
RN 774583-43-6 HCAPLUS  
 CN [1,1'-Binaphthalene]-4,4'-dimethanamine, 2,2'-bis(diphenylphosphino)-, dihydrobromide, (1S)- (9CI) (CA INDEX NAME)



● 2 HBr

RN 774583-54-9 HCAPLUS

CN [1,1'-Binaphthalene]-4,4'-dimethanamine, 2,2'-bis(diphenylphosphino)-, dihydrobromide (9CI) (CA INDEX NAME)



● 2 HBr

IC ICM C07F009-50

CC 29-7 (Organometallic and Organometalloidal Compounds)

Section cross-reference(s): 21, 78

IT Amines, uses

RL: CAT (Catalyst use); USES (Uses)

(diamines, chiral, racemic; prepn. of water-sol. chiral diphosphines and their transition-metal complexes, and use of the complexes as catalysts for asym. synthesis)

IT Phosphines

RL: CAT (Catalyst use); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)

(diphosphines, complexation with transition metals; prepn. of water-sol. chiral diphosphines and their transition-metal complexes, and use of the complexes as catalysts for asym. synthesis)

IT Transition metal complexes

RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)

(prepn. of water-sol. chiral diphosphines and their transition-metal complexes, and use of the complexes as catalysts for asym. synthesis)

IT 5700-60-7, 1,2-Diamino-1,2-diphenylethane  
 RL: CAT (Catalyst use); USES (Uses)  
 (chiral, racemic; prepn. of water-sol. chiral diphosphines and their transition-metal complexes, and use of the complexes as catalysts for asym. synthesis)

IT 681234-83-3P 774583-52-7P  
 RL: CAT (Catalyst use); SPN (Synthetic preparation);  
 PREP (Preparation); USES (Uses)  
 (prepn. of water-sol. chiral diphosphines and their transition-metal complexes, and use of the complexes as catalysts for asym. synthesis)

IT 94041-16-4P 94041-18-6P 328234-96-4P  
 681244-35-9P 681244-39-3P 681244-43-9P  
 681244-47-3P 681244-49-5P 709640-84-6P  
 709640-85-7P 774583-43-6P 774583-54-9P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
 (prepn. of water-sol. chiral diphosphines and their transition-metal complexes, and use of the complexes as catalysts for asym. synthesis)

REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L26 ANSWER 9 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:722953 HCAPLUS

DOCUMENT NUMBER: 141:225689

TITLE: Ligands for metals and improved metal-catalyzed processes based thereon

INVENTOR(S): Buchwald, Stephen L.; Huang, Xiaohua; Zim, Danilo

PATENT ASSIGNEE(S): USA

SOURCE: U.S. Pat. Appl. Publ., 99 pp., Cont.-in-part of U.S. Ser. No. 420,950.  
 CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 5

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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US 2004171833	A1	20040902	US 2003-731702	20031209
US 6395916	B1	20020528	US 1998-113478	19980710
US 6307087	B1	20011023	US 1999-231315	19990113
US 2002156295	A1	20021024	US 2001-4101	20011023
US 7026498	B2	20060411		
US 2004010149	A1	20040115	US 2003-420950	20030422

US 6946560 B2 20050920 <--  
 PRIORITY APPLN. INFO.: US 1998-113478 A2 199807  
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 US 1999-231315 A1 199901  
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 US 2001-4101 A3 200110  
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 US 2002-431870P P 200212  
 09  
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 US 2003-451562P P 200303  
 03  
 <--  
 US 2003-420950 A2 200304  
 22  
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OTHER SOURCE(S): CASREACT 141:225689; MARPAT 141:225689

AB One aspect of the present invention relates to ligands for transition metals. A second aspect of the present invention relates to the use of catalysts comprising these ligands in transition metal-catalyzed carbon-heteroatom and carbon-carbon bond-forming reactions. The subject methods provide improvements in many features of the transition metal-catalyzed reactions, including the range of suitable substrates, reaction conditions, and efficiency. Thus, Pd<sub>2</sub>(dba)<sub>3</sub>/2-Me<sub>2</sub>NC<sub>6</sub>H<sub>4</sub>C<sub>6</sub>H<sub>4</sub>PCy<sub>3</sub> catalyzed amination of 4-MeC<sub>6</sub>H<sub>4</sub>Cl with Bu<sub>2</sub>NH in the presence of NaOBu-t in PhMe. gave 95% 4-MeC<sub>6</sub>H<sub>4</sub>NBu<sub>2</sub> whereas Suzuki coupling reaction of 4-MeC<sub>6</sub>H<sub>4</sub>Cl with PhB(OH)<sub>2</sub> gave 96% 4-MeC<sub>6</sub>H<sub>4</sub>Ph.

IT 213697-53-1P 213774-71-1P 224311-51-7P,  
 2-(Di-tert-butylphosphino)biphenyl 224311-54-0P  
 224311-55-1P 255835-81-5P 255835-82-6P  
 255835-83-7P 255835-84-8P 255882-14-5P  
 564483-18-7P

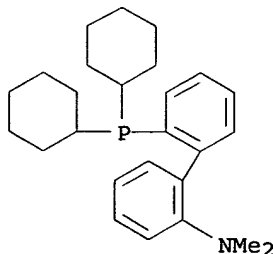
RL: CAT (Catalyst use); SPN (Synthetic preparation);

PREP (Preparation); USES (Uses)

(prepn. of phosphine ligands for  
 palladium catalyzed amination, Suzuki coupling, and other  
 carbon-carbon bond formation processes)

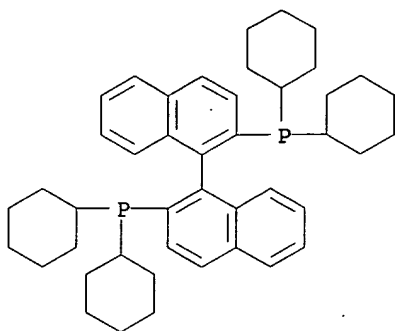
RN 213697-53-1 HCAPLUS

CN [1,1'-Biphenyl]-2-amine, 2'-(dicyclohexylphosphino)-N,N-dimethyl-  
 (9CI) (CA INDEX NAME)

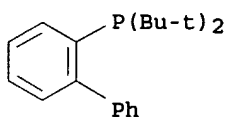


RN 213774-71-1 HCAPLUS

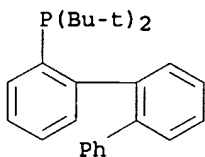
CN Phosphine, [1,1'-binaphthalene]-2,2'-diylbis[dicyclohexyl]- (9CI)  
(CA INDEX NAME)



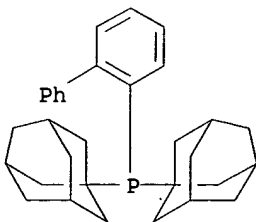
RN 224311-51-7 HCAPLUS  
CN Phosphine, [1,1'-biphenyl]-2-ylbis(1,1-dimethylethyl)- (9CI) (CA  
INDEX NAME)



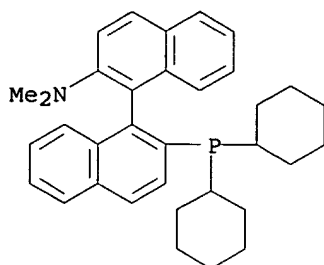
RN 224311-54-0 HCAPLUS  
CN Phosphine, bis(1,1-dimethylethyl)[1,1':2',1''-terphenyl]-2-yl- (9CI)  
(CA INDEX NAME)



RN 224311-55-1 HCAPLUS  
CN Phosphine, [1,1'-biphenyl]-2-ylbis(tricyclo[3.3.1.1.3,7]dec-1-yl)-  
(9CI) (CA INDEX NAME)

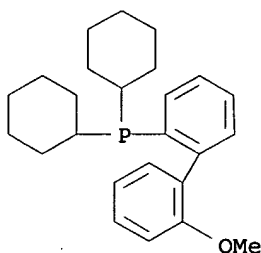


RN 255835-81-5 HCAPLUS  
CN [1,1'-Binaphthalen]-2-amine, 2'-(dicyclohexylphosphino)-N,N-dimethyl-  
(9CI) (CA INDEX NAME)



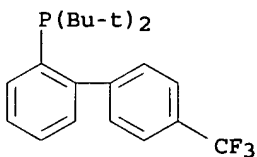
RN 255835-82-6 HCAPLUS

CN Phosphine, dicyclohexyl(2'-methoxy[1,1'-biphenyl]-2-yl)- (9CI) (CA INDEX NAME)



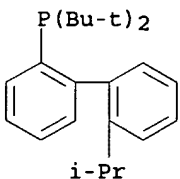
RN 255835-83-7 HCAPLUS

CN Phosphine, bis(1,1-dimethylethyl)(4'-(trifluoromethyl)[1,1'-biphenyl]-2-yl)- (9CI) (CA INDEX NAME)



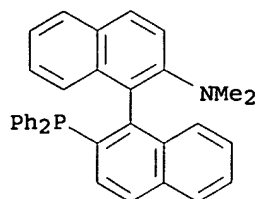
RN 255835-84-8 HCAPLUS

CN Phosphine, bis(1,1-dimethylethyl)(2'-(1-methylethyl)[1,1'-biphenyl]-2-yl)- (9CI) (CA INDEX NAME)



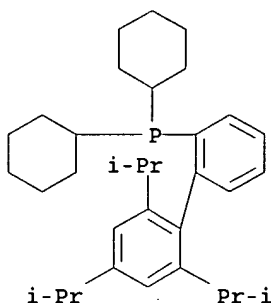
RN 255882-14-5 HCAPLUS

CN [1,1'-Binaphthalen]-2-amine, 2'-(diphenylphosphino)-N,N-dimethyl- (9CI) (CA INDEX NAME)



RN 564483-18-7 HCAPLUS

CN Phosphine, dicyclohexyl[2',4',6'-tris(1-methylethyl)[1,1'-biphenyl]-2-yl]- (9CI) (CA INDEX NAME)



IC ICM C07F009-02  
ICS C07F009-547

INCL 546022000; 548413000; 556404000; 568009000

CC 29-7 (Organometallic and Organometalloidal Compounds)

Section cross-reference(s): 21

IT 213697-53-1P 213774-71-1P 224311-51-7P,  
2-(Di-tert-butylphosphino)biphenyl 224311-54-0P  
224311-55-1P 255835-81-5P 255835-82-6P  
255835-83-7P 255835-84-8P 255835-85-9P  
255882-14-5P 564483-18-7P

RL: CAT (Catalyst use); SPN (Synthetic preparation);

PREP (Preparation); USES (Uses)

(prepn. of phosphine ligands for  
palladium catalyzed amination, Suzuki coupling, and other  
carbon-carbon bond formation processes)

L26 ANSWER 10 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:515555 HCAPLUS

DOCUMENT NUMBER: 141:71718

TITLE: Preparation of phosphine ligands for metals and improved metal-catalyzed processes based thereon

INVENTOR(S): Buchwald, Stephen L.; Huang, Xiaohua; Zim, Danilo

PATENT ASSIGNEE(S): Massachusetts Institute of Technology, USA

SOURCE: PCT Int. Appl., 198 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 5

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004052939	A2	20040624	WO 2003-US38945	

200312  
09

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WO 2004052939 A3 20041216

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH,  
CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD,  
GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ,  
LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ,  
NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK,  
SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA,  
ZM, ZWRW: BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM,  
AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE,  
DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO,  
SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML,  
MR, NE, SN, TD, TG

CA 2509522 AA 20040624 CA 2003-2509522

200312  
09

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AU 2003296326 A1 20040630 AU 2003-296326

200312  
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EP 1581467 A2 20051005 EP 2003-812849

200312  
09

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R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC,  
PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU,  
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CN 1745049 A 20060308 CN 2003-80109502

200312  
09

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JP 2006509046 T2 20060316 JP 2005-508499

200312  
09

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PRIORITY APPLN. INFO.: US 2002-431870P P

200212  
09

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US 2003-451562P P

200303  
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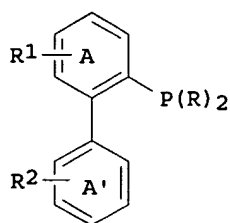
WO 2003-US38945 W

200312  
09

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OTHER SOURCE(S): CASREACT 141:71718; MARPAT 141:71718  
GI





I

AB One aspect of the present invention relates to prepn. of ligands I (R = alkyl, cycloalkyl, aryl, heteroaryl, aralkyl, heteroaralkyl, (CH<sub>2</sub>)<sub>m</sub>-R80, etc.; A, A' = biphenyl core independently may be (un)substituted with R1 and R2 resp., any no. of times up to limitations imposed by stability and rule of valence; R1, R2 = alkyl, cycloalkyl, aryl, heterocycloalkyl, heteroaryl, aralkyl, heteroaralkyl, organosilyl, (CH<sub>2</sub>)<sub>m</sub>-R80, etc.; R80 = (un)substituted aryl, cycloalkyl, cycloalkenyl, heterocycle, polycycle, etc.; m = 0-8) for transition metals. A second aspect of the present invention relates to the use of catalysts comprising these ligands in transition metal-catalyzed carbon-heteroatom and carbon-carbon bond-forming reactions. The subject methods provide improvements in many features of the transition metal-catalyzed reactions, including the range of suitable substrates, reaction conditions, and efficiency. Thus, tris(dibenzylideneacetone)dipalladium/2-Me<sub>2</sub>NC<sub>6</sub>H<sub>4</sub>C<sub>6</sub>H<sub>4</sub>PCy<sub>2</sub>-2 (Cy = cyclohexyl) catalyzed amination of 4-Me<sub>6</sub>H<sub>4</sub>NH<sub>2</sub> with 4-MeOC<sub>6</sub>H<sub>4</sub>Cl in the presence of NaOBu-t in PhMe at 80° gave 93% N-(4-methylphenyl)-p-anisidine.

IT 213697-53-1P 213774-71-1P 224311-51-7P  
224311-52-8P 224311-54-0P 224311-55-1P  
247940-06-3P 255835-81-5P 255835-82-6P  
255835-83-7P 255835-84-8P 255882-14-5P  
298205-47-7P 338800-02-5P 378787-28-1P  
382602-22-4P 564483-18-7P 564483-19-8P  
709667-71-0P 709667-72-1P 709667-73-2P  
709667-74-3P 709667-75-4P 709667-76-5P  
709667-77-6P

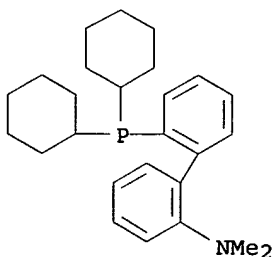
RL: CAT (Catalyst use); SPN (Synthetic preparation);

PREP (Preparation); USES (Uses)

(prepn. of phosphine ligands for  
palladium-catalyzed carbon-carbon bond forming reactions)

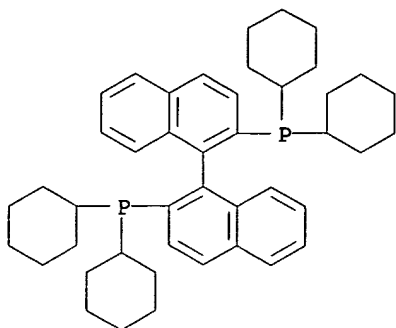
RN 213697-53-1 HCAPLUS

CN [1,1'-Biphenyl]-2-amine, 2'-(dicyclohexylphosphino)-N,N-dimethyl-  
(9CI) (CA INDEX NAME)

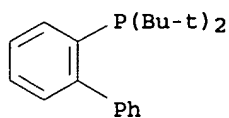


RN 213774-71-1 HCAPLUS

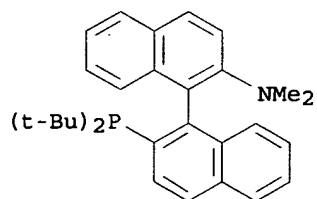
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(CA INDEX NAME)



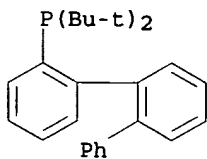
RN 224311-51-7 HCAPLUS  
 CN Phosphine, [1,1'-biphenyl]-2-ylbis(1,1-dimethylethyl)- (9CI) (CA INDEX NAME)



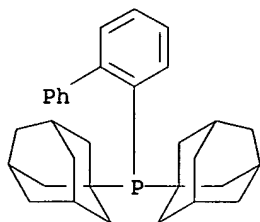
RN 224311-52-8 HCAPLUS  
 CN [1,1'-Binaphthalen]-2-amine, 2'-[bis(1,1-dimethylethyl)phosphino]-N,N-dimethyl- (9CI) (CA INDEX NAME)



RN 224311-54-0 HCAPLUS  
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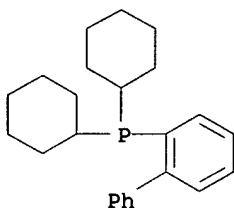


RN 224311-55-1 HCAPLUS  
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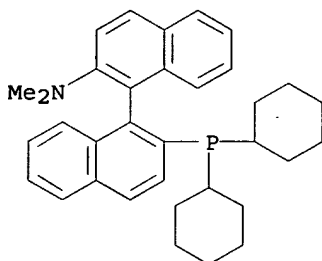
RN 247940-06-3 HCAPLUS

CN Phosphine, [1,1'-biphenyl]-2-ylidicyclohexyl- (9CI) (CA INDEX NAME)



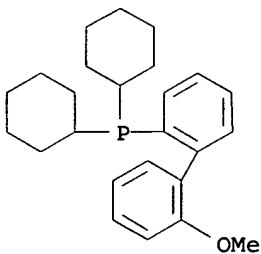
RN 255835-81-5 HCAPLUS

CN [1,1'-Binaphthalen]-2-amine, 2'-(dicyclohexylphosphino)-N,N-dimethyl- (9CI) (CA INDEX NAME)



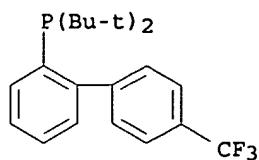
RN 255835-82-6 HCAPLUS

CN Phosphine, dicyclohexyl(2'-methoxy[1,1'-biphenyl]-2-yl)- (9CI) (CA INDEX NAME)

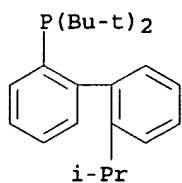


RN 255835-83-7 HCAPLUS

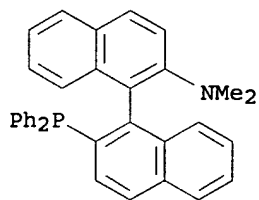
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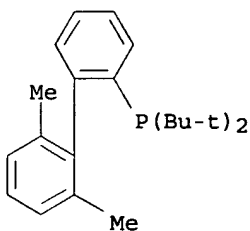
RN 255835-84-8 HCAPLUS  
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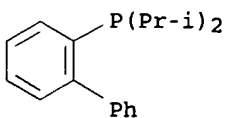
RN 255882-14-5 HCAPLUS  
 CN [1,1'-Binaphthalen]-2-amine, 2'-(diphenylphosphino)-N,N-dimethyl- (9CI) (CA INDEX NAME)



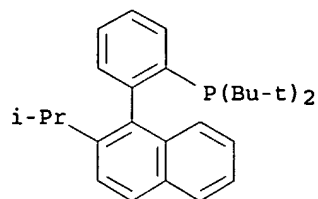
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 CN Phosphine, (2',6'-dimethyl[1,1'-biphenyl]-2-yl)bis(1,1-dimethylethyl)- (9CI) (CA INDEX NAME)



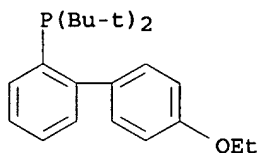
RN 338800-02-5 HCAPLUS  
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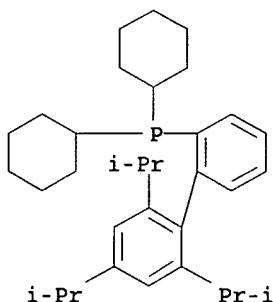
RN 378787-28-1 HCAPLUS  
 CN Phosphine, bis(1,1-dimethylethyl)[2-[2-(1-methylethyl)-1-naphthalenyl]phenyl]- (9CI) (CA INDEX NAME)



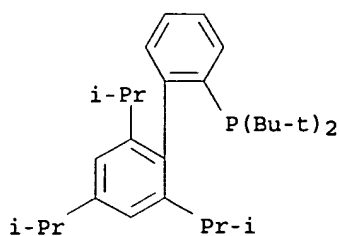
RN 382602-22-4 HCAPLUS  
 CN Phosphine, bis(1,1-dimethylethyl)(4'-ethoxy[1,1'-biphenyl]-2-yl)- (9CI) (CA INDEX NAME)



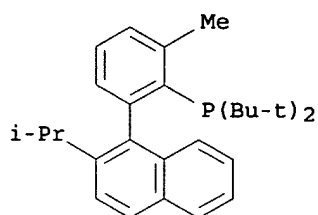
RN 564483-18-7 HCAPLUS  
 CN Phosphine, dicyclohexyl[2',4',6'-tris(1-methylethyl)[1,1'-biphenyl]-2-yl]- (9CI) (CA INDEX NAME)



RN 564483-19-8 HCAPLUS  
 CN Phosphine, bis(1,1-dimethylethyl)[2',4',6'-tris(1-methylethyl)[1,1'-biphenyl]-2-yl]- (9CI) (CA INDEX NAME)

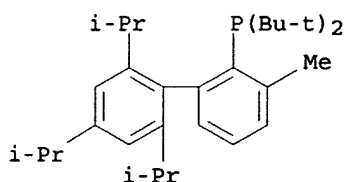


RN 709667-71-0 HCAPLUS  
 CN Phosphine, bis(1,1-dimethylethyl)[2-methyl-6-[2-(1-methylethyl)-1-naphthalenyl]phenyl]- (9CI) (CA INDEX NAME)



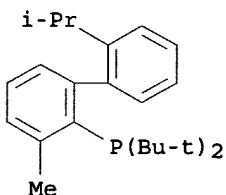
RN 709667-72-1 HCAPLUS

CN Phosphine, bis(1,1-dimethylethyl)[3-methyl-2',4',6'-tris(1-methylethyl)[1,1'-biphenyl]-2-yl]- (9CI) (CA INDEX NAME)



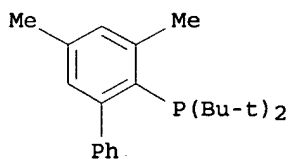
RN 709667-73-2 HCAPLUS

CN Phosphine, bis(1,1-dimethylethyl)[3-methyl-2'-(1-methylethyl)[1,1'-biphenyl]-2-yl]- (9CI) (CA INDEX NAME)



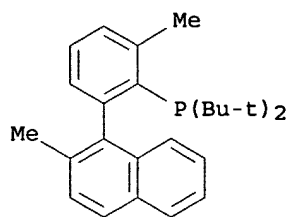
RN 709667-74-3 HCAPLUS

CN Phosphine, (3,5-dimethyl[1,1'-biphenyl]-2-yl)bis(1,1-dimethylethyl)- (9CI) (CA INDEX NAME)

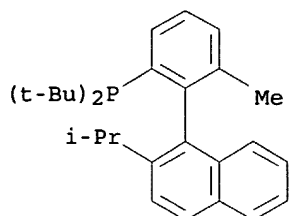


RN 709667-75-4 HCAPLUS

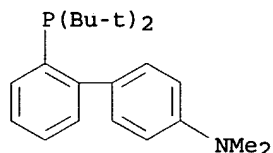
CN Phosphine, bis(1,1-dimethylethyl)[2-methyl-6-(2-methyl-1-naphthalenyl)phenyl]- (9CI) (CA INDEX NAME)



RN 709667-76-5 HCAPLUS  
 CN Phosphine, bis(1,1-dimethylethyl) [3-methyl-2-[2-(1-methylethyl)-1-naphthalenyl]phenyl]- (9CI) (CA INDEX NAME)



RN 709667-77-6 HCAPLUS  
 CN [1,1'-Biphenyl]-4-amine, 2'-[bis(1,1-dimethylethyl)phosphino]-N,N-dimethyl- (9CI) (CA INDEX NAME)



IC ICM C08F  
 CC 29-7 (Organometallic and Organometalloidal Compounds)  
 Section cross-reference(s): 21  
 IT 32673-25-9P 35823-26-8P 36297-54-8P 53098-11-6P 54000-83-8P  
 173593-25-4P 213697-53-1P 213774-71-1P  
 224311-51-7P 224311-52-8P 224311-54-0P  
 224311-55-1P 226089-00-5P 247940-06-3P  
 255835-81-5P 255835-82-6P 255835-83-7P  
 255835-84-8P 255835-85-9P 255837-14-0P  
 255882-14-5P 298205-47-7P 338800-02-5P  
 378787-28-1P 382602-22-4P 564483-18-7P  
 564483-19-8P 578763-02-7P 709667-71-0P  
 709667-72-1P 709667-73-2P 709667-74-3P  
 709667-75-4P 709667-76-5P 709667-77-6P  
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 709667-82-3P 709667-83-4P  
 RL: CAT (Catalyst use); SPN (Synthetic preparation);  
 PREP (Preparation); USES (Uses)  
 (prepn. of phosphine ligands for  
 palladium-catalyzed carbon-carbon bond forming reactions)

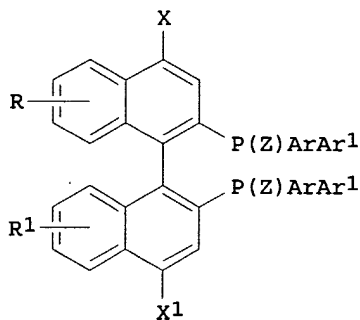
L26 ANSWER 11 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2004:515338 HCAPLUS  
 DOCUMENT NUMBER: 141:71717  
 TITLE: Chiral 4,4'-disubstituted binaphthyl

INVENTOR(S): diphosphines, their preparation, and their uses  
as ligands in asymmetric hydrogenation catalysts  
Lemaire, Marc; Saluzzo, Christine; Berthod,  
Mikael  
PATENT ASSIGNEE(S): Rhodia Chimie, Fr.; Centre National De La  
Recherche Scientifique Cnrs  
SOURCE: Fr. Demande, 41 pp.  
CODEN: FRXXBL  
DOCUMENT TYPE: Patent  
LANGUAGE: French  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
FR 2849037	A1	20040625	FR 2002-16087	20021218

PRIORITY APPLN. INFO.: <--  
FR 2002-16087  
20021218

OTHER SOURCE(S): <--  
CASREACT 141:71717; MARPAT 141:71717  
GI



I

AB Racemic and optically active diphosphines I [Z = lone pair; R, R1 = H, C1-6 alkyl, C1-6 alkoxy, etc.; Ar, Ar1 = alkyl, alkenyl, cycloalkyl, aryl, aralkyl, preferably Ph; X, X1 = (un)substituted alkyl, alkenyl, alkynyl, cycloalkyl, aryl, aralkyl, OH, CN, CH2NH2, CO2H or esters, CH2OH, NHNH2, N3, Mg, Li, etc., preferably fluoro-substituted alkyl, CN, CH2NH2, CO2H] and bis(phosphine oxide)s I [Z = O; same R, R1, Ar, Ar1, X, X1] useful, in their optically active form, as ligands for ruthenium, rhodium or iridium catalysts in asym. org. synthesis and in particular for enantioselective hydrogenation of C:C or C:O double bonds, are claimed, as are processes for prepn. of I. In an example, treating 0.0235 mmol (S)- or (R)-I (Z = lone pair; R = R1 = H; Ar = Ar1 = Ph; X = X1 = CH2NH2; prepn. given) in 1 mL CH2Cl2 with 0.0235 mmol bis(2-methylallyl)(1,5-cyclooctadiene)ruthenium for 30 min, followed by evapn. of solvent and addn. of MeOH or EtOH solvent and Me or Et acetoacetate substrate with a substrate-to-catalyst ratio of 1000:1 and hydrogenation at 40 bar H2 at 50° for 15 h gave 100% conversions to the corresponding alc. with >99% ee, where the configuration of the alc. product depended on the chirality of I used.

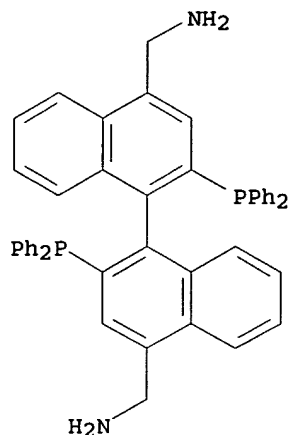
IT 681244-47-3P 681244-49-5P  
RL: CAT (Catalyst use); SPN (Synthetic preparation);



**PREP (Preparation); USES (Uses)**  
 (prepn. of chiral 4,4'-disubstituted binaphthyl  
 diphosphines, and their uses as ligands in  
 asym. hydrogenation catalysts)

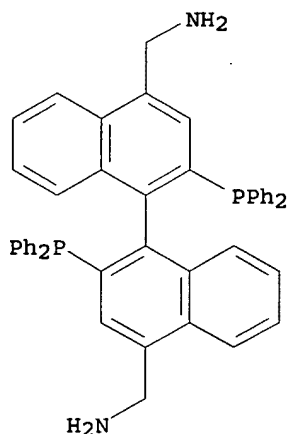
RN 681244-47-3 HCAPLUS

CN [1,1'-Binaphthalene]-4,4'-dimethanamine, 2,2'-bis(diphenylphosphino)-  
 , (1R)- (9CI) (CA INDEX NAME)



RN 681244-49-5 HCAPLUS

CN [1,1'-Binaphthalene]-4,4'-dimethanamine, 2,2'-bis(diphenylphosphino)-  
 , (1S)- (9CI) (CA INDEX NAME)



IC ICM C07F009-50

ICS C07F009-53

CC 29-7 (Organometallic and Organometalloidal  
 Compounds)

Section cross-reference(s): 21

IT 681244-47-3P 681244-49-5P

RL: CAT (Catalyst use); SPN (Synthetic preparation);

**PREP (Preparation); USES (Uses)**

(prepn. of chiral 4,4'-disubstituted binaphthyl  
 diphosphines, and their uses as ligands in  
 asym. hydrogenation catalysts)

REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR  
 THIS RECORD. ALL CITATIONS AVAILABLE IN  
 THE RE FORMAT

L26 ANSWER 12 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2004:515337 HCAPLUS  
 DOCUMENT NUMBER: 141:71716  
 TITLE: Chiral 5,5'-disubstituted binaphthyl  
 diphosphines, processes for their preparation,  
 and their uses as ligands in asymmetric  
 hydrogenation catalysts  
 INVENTOR(S): Lemaire, Marc; Saluzzo, Christine; Berthod,  
 Mikael  
 PATENT ASSIGNEE(S): Rhodia Chimie, Fr.; Centre National De La  
 Recherche Scientifique Cnrs  
 SOURCE: Fr. Demande, 45 pp.  
 CODEN: FRXXBL  
 DOCUMENT TYPE: Patent  
 LANGUAGE: French  
 FAMILY ACC. NUM. COUNT: 2  
 PATENT INFORMATION:

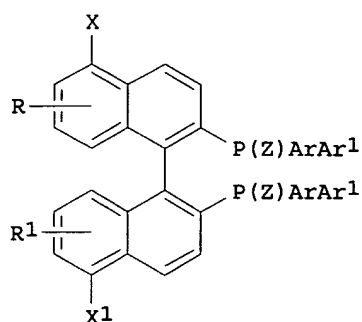
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
FR 2849036	A1	20040625	FR 2002-16086	20021218
FR 2849036	B1	20050520	<--	
CA 2509911	AA	20040708	CA 2003-2509911	20031217
WO 2004056483	A1	20040708	WO 2003-FR3782	20031217
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW RW: BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
AU 2003299336	A1	20040714	AU 2003-299336	20031217
CN 1738679	A	20060222	CN 2003-80109027	20031217
EP 1633477	A1	20060315	EP 2003-799617	20031217
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PRIORITY APPLN. INFO.:			FR 2002-16086	A
				20021218
			FR 2003-4392	A

200304  
09<--  
FR 2003-5255

A

200304  
29<--  
WO 2003-FR3782

W

200312  
17OTHER SOURCE(S): CASREACT 141:71716; MARPAT 141:71716  
GI

AB Racemic and optically active diphosphines I [Z = lone pair; R, R1 = H, C1-6 alkyl, C1-6 alkoxy; Ar, Ar1 = alkyl, alkenyl, cycloalkyl, aryl, aralkyl, preferably Ph; X, X1 = (un)substituted alkyl, alkenyl, alkynyl, cycloalkyl, aryl, aralkyl, Br, Cl, iodo, OH, CN, CH2NH2, CO2H or esters, CH2OH, NHNH2, N3, Mg, Li, etc.] and bis(phosphine oxide)s I [Z = O; same R, R1, Ar, Ar1; X, X1 = Cl, Br, iodo] useful, in their optically active form, as ligands for ruthenium, rhodium or iridium catalysts in asym. org. synthesis and in particular for enantioselective hydrogenation of C:C or C:O double bonds, are claimed, as are processes for prepn. of I. In an example, treating 0.0235 mmol (S)- or (R)-I (Z = lone pair; R = R1 = H; Ar = Ar1 = Ph; X = X1 = CH2NH2; prepn. given) in 1 mL CH2Cl2 with 0.0235 mmol bis(2-methylallyl)(1,5-cyclooctadiene)ruthenium for 30 min, followed by evapn. of solvent and addn. of MeOH or EtOH solvent and Me or Et acetoacetate substrate with a substrate-to-catalyst ratio of 1000:1 and hydrogenation at 40 bar H2 at 50° for 15 h gave 100% conversions to the corresponding alc. with >99% ee, where the configuration of the alc. product depended on the chirality of I used.

IT 681244-51-9P 709640-82-4P

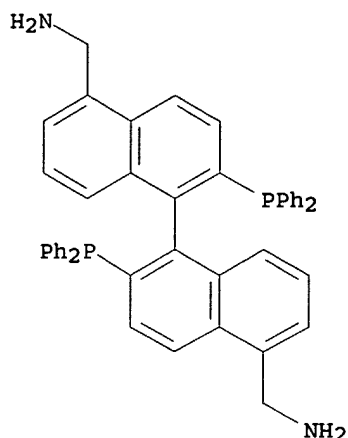
RL: CAT (Catalyst use); SPN (Synthetic preparation);

PREP (Preparation); USES (Uses)

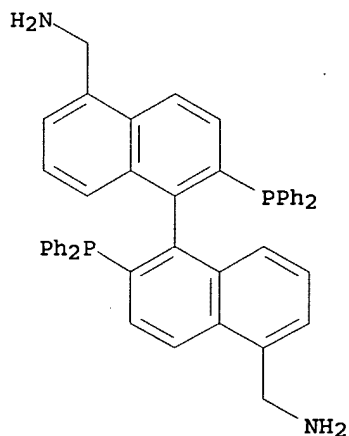
(prepn. of chiral binaphthyl diphosphines,  
and their uses as ligands in asym. hydrogenation  
catalysts)

RN 681244-51-9 HCAPLUS

CN [1,1'-Binaphthalene]-5,5'-dimethanamine, 2,2'-bis(diphenylphosphino)-  
, (1R)- (9CI) (CA INDEX NAME)



RN 709640-82-4 HCAPLUS  
 CN [1,1'-Binaphthalene]-5,5'-dimethanamine, 2,2'-bis(diphenylphosphino)-  
 , (1S)- (9CI) (CA INDEX NAME)



IC ICM C07F009-50  
 ICS B01J031-24; C07F015-00  
 CC 29-7 (Organometallic and Organometalloidal  
 Compounds)  
 Section cross-reference(s): 21  
 IT 681244-51-9P 709640-82-4P  
 RL: CAT (Catalyst use); SPN (Synthetic preparation);  
 PREP (Preparation); USES (Uses)  
 (prepn. of chiral binaphthyl diphosphines,  
 and their uses as ligands in asym. hydrogenation  
 catalysts)

REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR  
 THIS RECORD. ALL CITATIONS AVAILABLE IN  
 THE RE FORMAT

L26 ANSWER 13 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2004:493713 HCAPLUS  
 DOCUMENT NUMBER: 141:63880  
 TITLE: Asymmetric synthesis using  
 transition metal complex  
 having diphosphine complex as  
 ligand

INVENTOR(S): Goto, Mitsutaka; Yamano, Mitsuhisa; Kawaguchi, Shinji  
 PATENT ASSIGNEE(S): Takeda Chemical Industries, Ltd., Japan  
 SOURCE: PCT Int. Appl., 41 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004050667	A1	20040617	WO 2003-JP15536	20031204
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW RW: BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
AU 2003289177	A1	20040623	AU 2003-289177	20031204
JP 2004196793	A2	20040715	JP 2003-406173	20031204
EP 1568701	A1	20050831	EP 2003-777248	20031204
CN 1720252	A	20060111	CN 2003-80105194	20031204
US 2006094887	A1	20060504	US 2005-536731	20050527
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
PRIORITY APPLN. INFO.: JP 2002-354341 A 20021205 WO 2003-JP15536 W 20031204				

OTHER SOURCE(S): MARPAT 141:63880

AB A transition metal complex having 2,2'-bis[bis(3,5-di-tert-butyl-4-methoxyphenyl)phosphino]-1,1'-binaphthyl as a ligand is used for asym. synthesis, in particular asym. hydrogenation of  $\beta$ -oxoalkanoic acid esters of formula  $R_1COCH(R)CO_2R_2$  [R = halo, each (un)substituted alkylsulfonyl or arylsulfonyl; R<sub>1</sub> = each

(un)substituted hydrocarbyl or heterocyclyl; R2 = (un)substituted hydrocarbyl] to chiral  $\beta$ -hydroxy alkanolic acid esters of formula  $R_1C^*H(OH)CH(R)CO_2R_2$  (R-R2 = same as above; \* denotes an asym. carbon atom). The presence of the transition metal complex in the reaction system of an asym. reaction system allows the prepn. of an objective compd. having an objective abs. configuration with improved efficiency. Thus, 12.66 mg (S)-2,2'-bis[bis(3,5-di-tert-butyl-4-methoxyphenyl)phosphino]-1,1'-biphenyl was added to a soln. of 4.27 mg Rh(cod)2OTf in 1 mL MeOH and stirred at room temp. for 30 min to give a soln. of ruthenium complex which was added to a soln. of 0.10 g Me (Z)- $\alpha$ -acetamidocinnamate in 4 mL MeOH and hydrogenated under 1.0 MPa H pressure at 25° for 24 h to give Me (R)-3-phenyl-2-acetamidopropanoate with >99.9% conversion and 91.4% ee.

IT 704913-96-2P

RL: CAT (Catalyst use); SPN (Synthetic preparation);

PREP (Preparation); USES (Uses)

(catalyst for asym. hydrogenation or Heck arylation; asym.

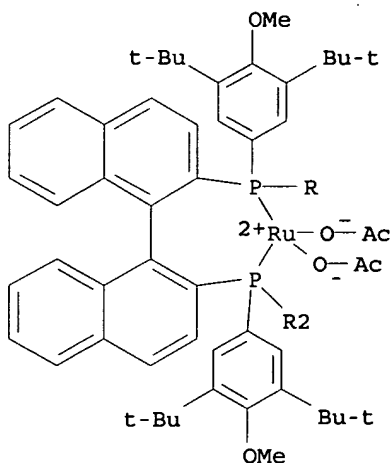
synthesis using transition metal

complex having diphosphine complex as ligand)

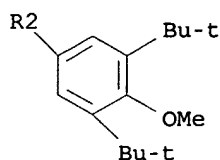
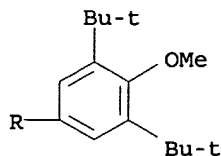
RN 704913-96-2 HCAPLUS

CN Ruthenium, bis(acetato- $\kappa O$ ) [(1S)-[1,1'-binaphthalene]-2,2'-diylbis[bis[3,5-bis(1,1-dimethylethyl)-4-methoxyphenyl]phosphine- $\kappa P$ ]]- (9CI) (CA INDEX NAME)

PAGE 1-A



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IT 132071-87-5P

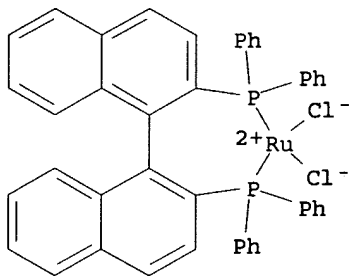
RL: CAT (Catalyst use); SPN (Synthetic preparation);

PREP (Preparation); USES (Uses)

(catalyst for asym. hydrogenation; asym. **synthesis**  
using **transition metal** complex having  
**diphosphine** complex as **ligand**)

RN 132071-87-5 HCAPLUS

CN Ruthenium, [(1R)-[1,1'-binaphthalene]-2,2'-diylbis[diphenylphosphine-  
κP]]dichloro-, (SP-4-2)- (9CI) (CA INDEX NAME)



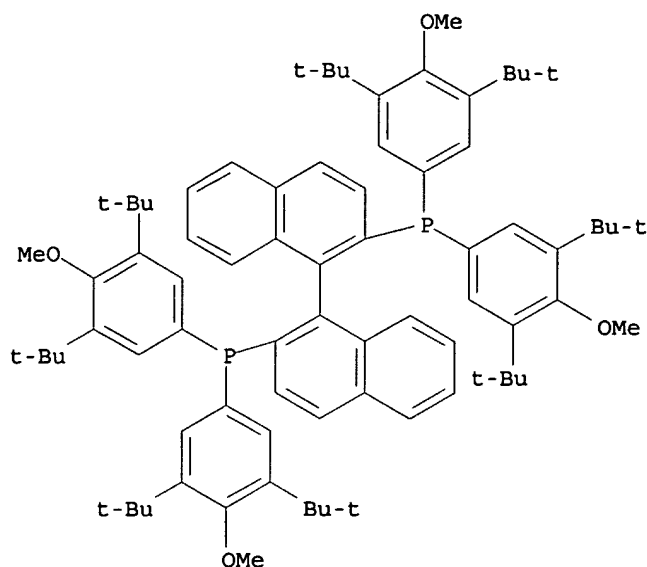
IT 541502-07-2P

RL: CAT (Catalyst use); RCT (Reactant); SPN (Synthetic  
preparation); PREP (Preparation); RACT (Reactant or  
reagent); USES (Uses)

(catalyst **ligand** for asym. hydrogenation or Heck  
arylation; asym. **synthesis** using **transition**  
**metal** complex having **diphosphine** complex as  
**ligand**)

RN 541502-07-2 HCAPLUS

CN Phosphine, (1S)-[1,1'-binaphthalene]-2,2'-diylbis[bis[3,5-bis(1,1-  
dimethylethyl)-4-methoxyphenyl]- (9CI) (CA INDEX NAME)



- IC ICM C07F009-50  
ICS C07F015-00; C07D301-26; C07D303-40; C07D307-28; C07C231-18;  
C07C233-47; C07M007-00
- CC 78-7 (Inorganic Chemicals and Reactions)  
Section cross-reference(s): 29
- IT Carbonates, reactions  
RL: RGT (Reagent); RACT (Reactant or reagent)  
(alkali metal; asym. **synthesis** using  
**transition metal** complex having  
**diphosphine** complex as ligand)
- IT Asymmetric **synthesis** and induction  
(asym. **synthesis** using **transition**  
**metal** complex having **diphosphine** complex as  
ligand)
- IT **Transition metal** complexes  
RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP  
(Preparation); USES (Uses)  
(asym. **synthesis** using **transition**  
**metal** complex having **diphosphine** complex as  
ligand)
- IT Alcohols, uses  
RL: NUU (Other use, unclassified); USES (Uses)  
(asym. **synthesis** using **transition**  
**metal** complex having **diphosphine** complex as  
ligand)
- IT Carboxylic acids, **preparation**  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(hydroxy, asym. hydrogenation of  $\beta$ -oxoalkanoic acids to  
 $\beta$ -hydroxyalkanoic acids; asym. **synthesis** using  
**transition metal** complex having  
**diphosphine** complex as ligand)
- IT Carboxylic acids, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(oxo, asym. hydrogenation of  $\beta$ -oxoalkanoic acids; asym.  
**synthesis** using **transition metal**  
complex having **diphosphine** complex as ligand)
- IT Arylation  
Arylation catalysts  
(stereoselective Heck arylation; asym. **synthesis** using  
**transition metal** complex having  
**diphosphine** complex as ligand)



- IT Hydrogenation  
Hydrogenation catalysts  
(stereoselective; asym. **synthesis** using  
transition metal complex having  
diphosphine complex as ligand)
- IT 7439-88-5D, Iridium, complex with 2,2'-bis[bis(3,5-di-tert-butyl-4-methoxyphenyl)phosphino]-1,1'-binaphthyl 7440-02-0D, Nickel, complex with 2,2'-bis[bis(3,5-di-tert-butyl-4-methoxyphenyl)phosphino]-1,1'-binaphthyl 7440-05-3D, Palladium, complex with 2,2'-bis[bis(3,5-di-tert-butyl-4-methoxyphenyl)phosphino]-1,1'-binaphthyl 7440-16-6D, Rhodium, complex with 2,2'-bis[bis(3,5-di-tert-butyl-4-methoxyphenyl)phosphino]-1,1'-binaphthyl 7440-18-8D, Ruthenium, complex with 2,2'-bis[bis(3,5-di-tert-butyl-4-methoxyphenyl)phosphino]-1,1'-binaphthyl 7440-50-8D, Copper, complex with 2,2'-bis[bis(3,5-di-tert-butyl-4-methoxyphenyl)phosphino]-1,1'-binaphthyl 541502-07-2D, complex with transition metal  
RL: CAT (Catalyst use); USES (Uses)  
(asym. **synthesis** using transition metal complex having diphosphine complex as ligand)
- IT 358-23-6, Trifluoromethanesulfonic anhydride 616-42-2, Dimethyl sulfite 762-04-9, Diethyl phosphite 1139-52-2, 4-Bromo-2,6-di-tert-butylphenol 1191-99-7, 2,3-Dihydrofuran 16940-66-2, Sodium borohydride 17763-67-6, Phenyl trifluoromethanesulfonate 18531-99-2, (S)-1,1'-Binaphthol 41381-97-9, 2-Chloro-3-oxo-3-phenylpropionic acid ethyl ester 60676-51-9, Methyl (Z)- $\alpha$ -acetamidocinnamate  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(asym. **synthesis** using transition metal complex having diphosphine complex as ligand)
- IT 1516-96-7P, 4-Bromo-2,6-di-tert-butylanisole 128544-05-8P 146452-40-6P 535925-40-7P 540731-05-3P  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(asym. **synthesis** using transition metal complex having diphosphine complex as ligand)
- IT 21156-62-7P 126060-73-9P 191427-03-9P  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(asym. **synthesis** using transition metal complex having diphosphine complex as ligand)
- IT 37366-09-9 99326-34-8, Bis(cyclooctadiene)rhodium triflate 704913-97-3 704913-99-5  
RL: CAT (Catalyst use); USES (Uses)  
(catalyst for asym. hydrogenation or Heck arylation; asym. **synthesis** using transition metal complex having diphosphine complex as ligand)
- IT 704913-96-2P  
RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
(catalyst for asym. hydrogenation or Heck arylation; asym. **synthesis** using transition metal complex having diphosphine complex as ligand)
- IT 12289-94-0 50982-12-2 76189-55-4 705281-18-1  
RL: CAT (Catalyst use); USES (Uses)  
(catalyst for asym. hydrogenation; asym. **synthesis** using transition metal complex having diphosphine complex as ligand)
- IT 132071-87-5P  
RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
(catalyst for asym. hydrogenation; asym. **synthesis**

using transition metal complex having  
diphosphine complex as ligand)

IT 14647-23-5, [1,2-Bis(diphenylphosphino)ethane]dichloronickel  
RL: CAT (Catalyst use); USES (Uses)  
(catalyst for coupling reaction; asym. synthesis using  
transition metal complex having  
diphosphine complex as ligand)

IT 541502-07-2P  
RL: CAT (Catalyst use); RCT (Reactant); SPN (Synthetic  
preparation); PREP (Preparation); RACT (Reactant or  
reagent); USES (Uses)  
(catalyst ligand for asym. hydrogenation or Heck  
arylation; asym. synthesis using transition  
metal complex having diphosphine complex as  
ligand)

IT 76189-56-5, (S)-2,2'-Bis(diphenylphosphino)-1,1'-binaphthyl  
RL: CAT (Catalyst use); USES (Uses)  
(catalyst ligand for asym. hydrogenation; asym.  
synthesis using transition metal  
complex having diphosphine complex as ligand)

REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR  
THIS RECORD. ALL CITATIONS AVAILABLE IN  
THE RE FORMAT

L26 ANSWER 14 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2004:370971 HCAPLUS  
DOCUMENT NUMBER: 140:375681  
TITLE: Late transition metal catalysts for olefin  
oligomerizations  
INVENTOR(S): Zhao, Baiyi; Kacker, Smita; Canich, Jo Ann M.  
PATENT ASSIGNEE(S): Exxonmobil Chemical Patents Inc., USA  
SOURCE: PCT Int. Appl., 58 pp.  
CODEN: PIXXD2  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 2  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004037869	A2	20040506	WO 2003-US33974	200310 24

WO 2004037869 A3 20040910  
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH,  
CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD,  
GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ,  
LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ,  
NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK,  
SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU,  
ZA, ZM, ZW  
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ,  
BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK,  
EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE,  
SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR,  
NE, SN, TD, TG

AU 2003287220	A1	20040513	AU 2003-287220	200310 24
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US 2004138056	A1	20040715	US 2003-693584	200310 24
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US 2005003955

A1

20050106

US 2003-692827

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PRIORITY APPLN. INFO.:

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US 2002-421359P

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200210  
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US 2002-421486P

P

200210  
25<--  
WO 2003-US33974

W

200310  
24

&lt;--

OTHER SOURCE(S): MARPAT 140:375681

AB A compn. of matter useful as catalysts for oligomerization of olefins comprises: (a) a Group 8, 9, or 10 **transition metal**, M; (b) an ancillary **ligand** comprising: (i) a terminal amine comprising two independently selected hydrocarbyl radicals, R1 and R2; (ii) a terminal **phosphine** comprising two independently selected hydrocarbyl radicals, R3 and R4; and (iii) a hydrocarbyl bridge, Y, comprising a backbone wherein the hydrocarbyl bridge connects between the terminal amine and the terminal **phosphine** and wherein the backbone comprises a chain that is four or more carbon atoms long; and (c) an abstractable **ligand**, X. The catalysts demonstrate high activity and selectivity for linear  $\alpha$ -olefins.

2-(N,N-Dimethylamino)-2'-(dicyclohexylphosphino)biphenyl nickel dibromide was **prepd.** and used with Me aluminoxane in oligomerization of ethylene. The catalysts demonstrate high activity and selectivity for linear  $\alpha$ -olefins.

IT 685517-31-1P 685517-32-2P 685517-33-3P

RL: CAT (Catalyst use); IMF (Industrial manufacture);

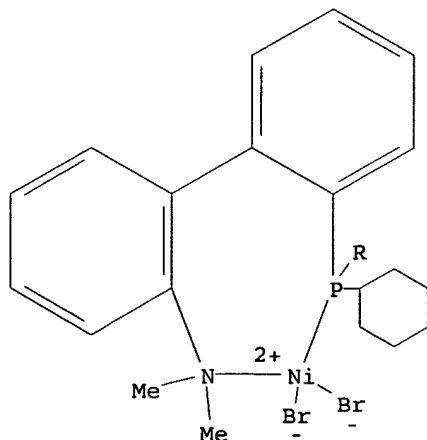
PREP (Preparation); USES (Uses)

(late transition metal catalysts for olefin oligomerizations)

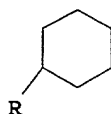
RN 685517-31-1 HCAPLUS

CN Nickel, dibromo[2'-(dicyclohexylphosphino- $\kappa$ P)-N,N-dimethyl[1,1'-biphenyl]-2-amine- $\kappa$ N]-, (T-4)- (9CI) (CA INDEX NAME)

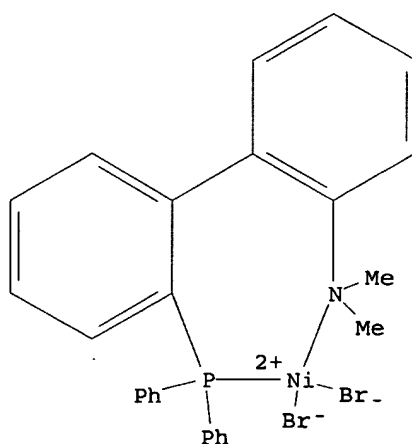
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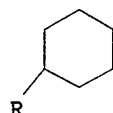
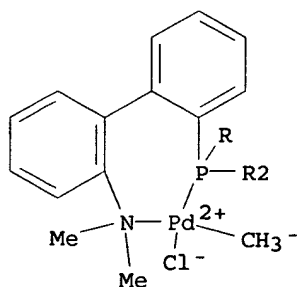
PAGE 2-A



RN 685517-32-2 HCAPLUS  
 CN Nickel, dibromo[2'-(diphenylphosphino-κP)-N,N-dimethyl[1,1'-biphenyl]-2-amine-κN]-, (T-4)- (9CI) (CA INDEX NAME)

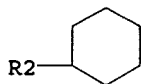


RN 685517-33-3 HCAPLUS  
 CN Palladium, chloro[2'-(dicyclohexylphosphino-κP)-N,N-dimethyl[1,1'-biphenyl]-2-amine-κN]methyl- (9CI) (CA INDEX NAME)



PAGE 1-A

PAGE 2-A



IC ICM C08F004-00  
 CC 35-3 (Chemistry of Synthetic High Polymers)  
 Section cross-reference(s): 29, 78  
 IT Aluminoxanes  
 RL: CAT (Catalyst use); USES (Uses)  
 (Me; late transition metal catalysts for olefin oligomerizations)  
 IT 685517-31-1P 685517-32-2P 685517-33-3P  
 RL: CAT (Catalyst use); IMF (Industrial manufacture);  
 PREP (Preparation); USES (Uses)  
 (late transition metal catalysts for olefin oligomerizations)

L26 ANSWER 15 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:370941 HCAPLUS

DOCUMENT NUMBER: 140:375679

TITLE: Late transition metal catalysts for olefin oligomerizations

INVENTOR(S): Zhao, Baiyi; Kacker, Smita; Canich, Jo Ann M.

PATENT ASSIGNEE(S): Exxonmobil Chemical Patents Inc., USA

SOURCE: PCT Int. Appl., 55 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 2

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004037837	A1	20040506	WO 2003-US33970	20031024

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW

RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

AU 2003284160	A1	20040513	AU 2003-284160	20031024
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US 2004138056	A1	20040715	US 2003-693584	20031024
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US 2005003955	A1	20050106	US 2003-692827	20031024
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PRIORITY APPLN. INFO.:	US 2002-421359P	P	200210
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25

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US 2002-421486P P

200210  
25

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WO 2003-US33970 W

200310  
24

&lt;--

OTHER SOURCE(S): MARPAT 140:375679

AB A compn. of matter useful as catalysts for oligomerization of olefins comprises: (a) a Group 8, 9, or 10 **transition metal**, M, excluding palladium; (b) an ancillary **ligand** comprising: (i) a terminal amine comprising two independently selected hydrocarbyl radicals, R1 and R2; (ii) a terminal **phosphine** comprising two independently selected hydrocarbyl radicals, R3 and R4; and (iii) a hydrocarbyl bridge, Y, comprising a backbone wherein the hydrocarbyl bridge connects between the terminal amine and the terminal **phosphine** and wherein the backbone comprises a chain that is four or more carbon atoms long; and (c) an abstractable **ligand**, X. The catalysts demonstrate high activity and selectivity for linear  $\alpha$ -olefins. 2-(N,N-Dimethylamino)-2'-(dicyclohexylphosphino)biphenyl nickel dibromide was **prepd** and used with Me aluminoxane in oligomerization of ethylene.

IT 685517-31-1P 685517-32-2P

RL: CAT (Catalyst use); IMF (Industrial manufacture);

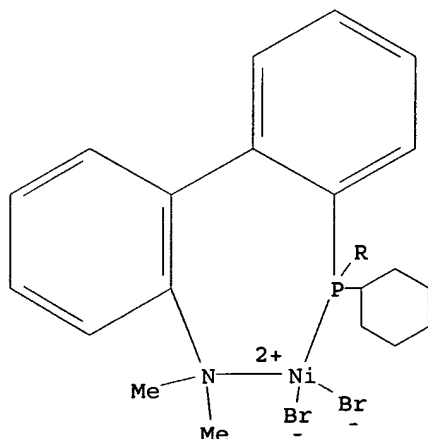
PREP (Preparation); USES (Uses)

(late transition metal catalysts for olefin oligomerizations)

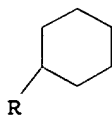
RN 685517-31-1 HCAPLUS

CN Nickel, dibromo[2'-(dicyclohexylphosphino- $\kappa$ P)-N,N-dimethyl[1,1'-biphenyl]-2-amine- $\kappa$ N]-, (T-4)- (9CI) (CA INDEX NAME)

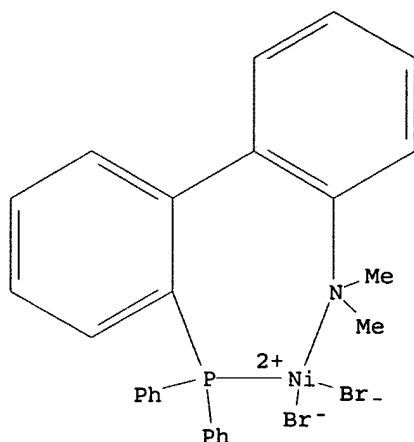
PAGE 1-A



PAGE 2-A

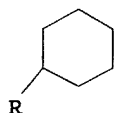
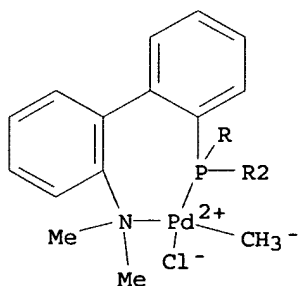


RN 685517-32-2 HCAPLUS  
 CN Nickel, dibromo[2'-(diphenylphosphino-κP)-N,N-dimethyl[1,1'-biphenyl]-2-amine-κN]-, (T-4)- (9CI) (CA INDEX NAME)

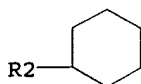


IT 685517-33-3P  
 RL: IMF (Industrial manufacture); **PREP (Preparation)**  
 (late transition metal catalysts for olefin oligomerizations)  
 RN 685517-33-3 HCAPLUS  
 CN Palladium, chloro[2'-(dicyclohexylphosphino-κP)-N,N-dimethyl[1,1'-biphenyl]-2-amine-κN]methyl- (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 2-A



IC ICM C07F015-00  
 ICS C07F015-02; C07F015-04; C07F015-06; C08F010-00; C08F004-00;  
 C08F002-00

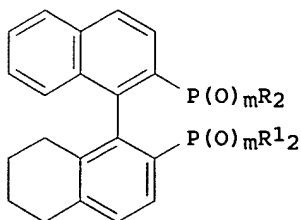
CC 35-3 (Chemistry of Synthetic High Polymers)  
 Section cross-reference(s): 29, 67, 78  
 IT Aluminoxanes  
 RL: CAT (Catalyst use); USES (Uses)  
 (Me; late transition metal catalysts for olefin oligomerizations)  
 IT Transition metal complexes  
 RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP  
 (Preparation); USES (Uses)  
 (late transition metal catalysts for olefin oligomerizations)  
 IT 685517-31-1P 685517-32-2P  
 RL: CAT (Catalyst use); IMF (Industrial manufacture);  
 PREP (Preparation); USES (Uses)  
 (late transition metal catalysts for olefin oligomerizations)  
 IT 685517-33-3P  
 RL: IMF (Industrial manufacture); PREP (Preparation)  
 (late transition metal catalysts for olefin oligomerizations)

L26 ANSWER 16 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2003:643167 HCAPLUS  
 DOCUMENT NUMBER: 139:164886  
 TITLE: Preparation of chiral diphosphine ligands with  
 non-C2 symmetry axis and their application  
 INVENTOR(S): Ding, Kuiling; Shen, Xiaoqiang  
 PATENT ASSIGNEE(S): Shanghai Inst. of Organic Chemistry, Chinese  
 Academy of Sciences, Peop. Rep. China  
 SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 24  
 pp.  
 CODEN: CNXXEV  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Chinese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
----- CN 1356333	A	20020703	CN 2001-139085	200112 07

PRIORITY APPLN. INFO.: <--  
 CN 2001-139085  
 200112  
 07

OTHER SOURCE(S): <--  
 CASREACT 139:164886; MARPAT 139:164886  
 GI



I

AB The diphosphine ligands I (R, R1 = Ph, substituted Ph, alkyl, cycloalkyl, 1-naphthyl, 2-naphthyl; m = 0, 1) are prepd. by esterifying (S)- or (R)-5,6,7,8-tetrahydro-1,1'-binaphthol with trifluoromethanesulfonic anhydride (at a molar ratio of 1:2-4) in polar solvent in the presence of org. amine at (-100)-25° for 1-8 h; coupling with R2PHO (at a molar ratio



of 1:1-4) in org. solvent in the presence of **transition metal-phosphine ligand complex catalyst** at 60-130° for 2-30 h to obtain 5',6',7',8'-tetrahydro-2'-[di(R)-phosphinyl]-1,1'-binaphthyl-2-yl trifluoromethanesulfonate; reducing with Cl<sub>3</sub>SiH (at a molar ratio of 1:2-20) in org. solvent in the presence of org. amine at 70-140° for 8-25 h to obtain 5',6',7',8'-tetrahydro-2'-[di(R)-phosphino]-1,1'-binaphthyl-2-yl trifluoromethanesulfonate; coupling again with R12PHO at 60-130° for 2-20 h; and reducing again with Cl<sub>3</sub>SiH. The **diphosphine ligand** may be used to **prep.** the catalyst for asym. catalytic hydrogenation. Acetophenone was asym. reduced by hydrogenation using the catalyst.

IT 575458-74-1P

RL: CAT (Catalyst use); SPN (Synthetic preparation);

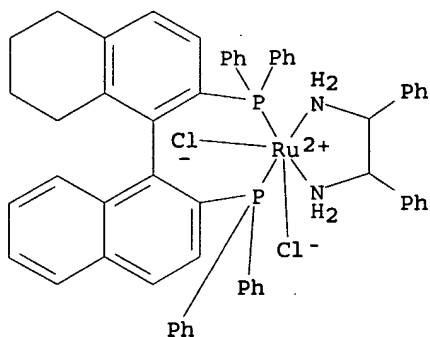
PREP (Preparation); USES (Uses)

(prepn. of chiral diphosphine ligands

with non-C2 symmetry axis and their application)

RN 575458-74-1 HCAPLUS

CN Ruthenium, dichloro[(1S,2S)-1,2-diphenyl-1,2-ethanediamine-κN,κN'][[[(1R)-5,6,7,8-tetrahydro[1,1'-binaphthalene]-2,2'-diyl]bis[diphenylphosphine-κP]]-], (OC-6-14)- (9CI) (CA INDEX NAME)



IT 575458-45-6P 575458-46-7P 575458-47-8P  
 575458-48-9P 575458-49-0P 575458-50-3P  
 575458-51-4P 575458-52-5P 575458-53-6P  
 575458-54-7P 575458-55-8P 575458-56-9P  
 575458-57-0P 575458-58-1P 575458-59-2P  
 575458-60-5P 575458-61-6P 575458-62-7P  
 575458-70-7P 575458-71-8P 575458-72-9P  
 575458-73-0P

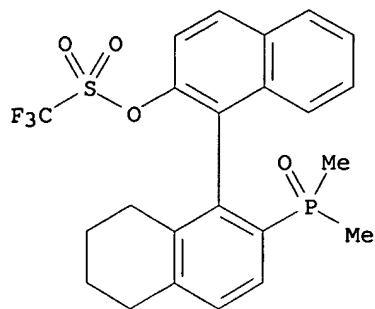
RL: RCT (Reactant); SPN (Synthetic preparation); PREP

(Preparation); RACT (Reactant or reagent)

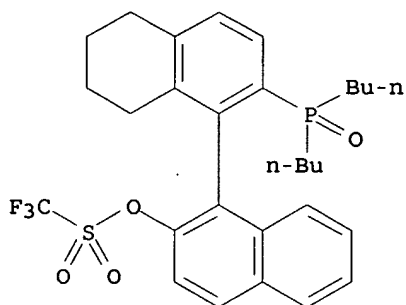
(prepn. of chiral diphosphine ligands with non-C2 symmetry axis and their application)

RN 575458-45-6 HCAPLUS

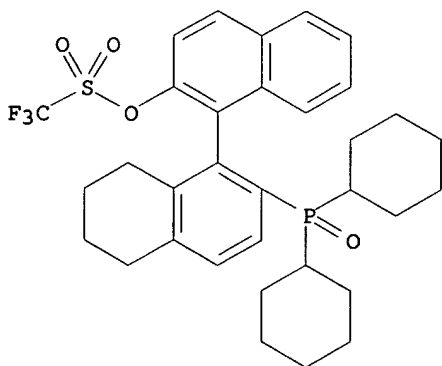
CN Methanesulfonic acid, trifluoro-, (1S)-2'-(dimethylphosphinyl)-5',6',7',8'-tetrahydro[1,1'-binaphthalen]-2-yl ester (9CI) (CA INDEX NAME)



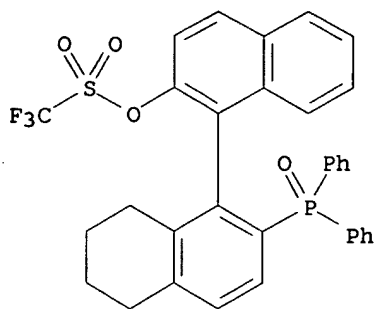
RN 575458-46-7 HCAPLUS  
 CN Methanesulfonic acid, trifluoro-, (1S)-2'-(dibutylphosphinyl)-5',6',7',8'-tetrahydro[1,1'-binaphthalen]-2-yl ester (9CI) (CA INDEX NAME)



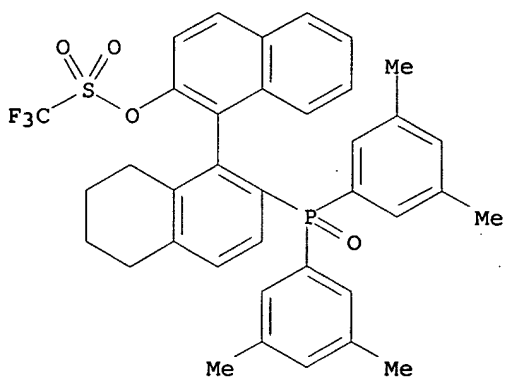
RN 575458-47-8 HCAPLUS  
 CN Methanesulfonic acid, trifluoro-, (1S)-2'-(dicyclohexylphosphinyl)-5',6',7',8'-tetrahydro[1,1'-binaphthalen]-2-yl ester (9CI) (CA INDEX NAME)



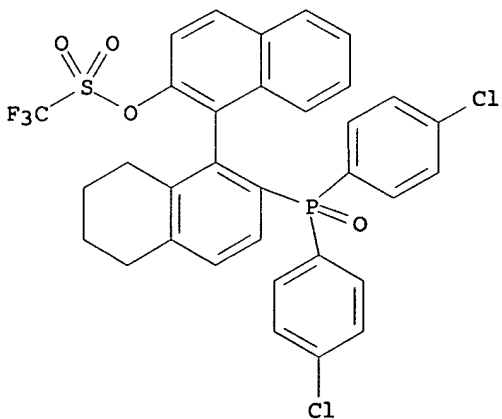
RN 575458-48-9 HCAPLUS  
 CN Methanesulfonic acid, trifluoro-, (1S)-2'-(diphenylphosphinyl)-5',6',7',8'-tetrahydro[1,1'-binaphthalen]-2-yl ester (9CI) (CA INDEX NAME)



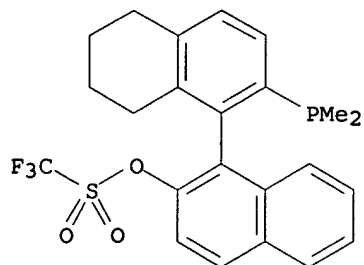
RN 575458-49-0 HCAPLUS  
 CN Methanesulfonic acid, trifluoro-, (1S)-2'-[bis(3,5-dimethylphenyl)phosphinyl]-5',6',7',8'-tetrahydro[1,1'-binaphthalen]-2-yl ester (9CI) (CA INDEX NAME)



RN 575458-50-3 HCAPLUS  
 CN Methanesulfonic acid, trifluoro-, (1S)-2'-[bis(4-chlorophenyl)phosphinyl]-5',6',7',8'-tetrahydro[1,1'-binaphthalen]-2-yl ester (9CI) (CA INDEX NAME)

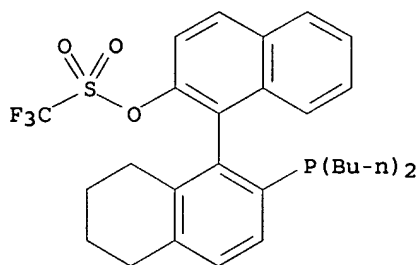


RN 575458-51-4 HCAPLUS  
 CN Methanesulfonic acid, trifluoro-, (1S)-2'-(dimethylphosphino)-5',6',7',8'-tetrahydro[1,1'-binaphthalen]-2-yl ester (9CI) (CA INDEX NAME)



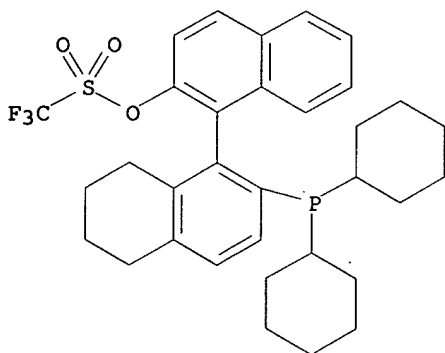
RN 575458-52-5 HCAPLUS

CN Methanesulfonic acid, trifluoro-, (1S)-2'-(dibutylphosphino)-5',6',7',8'-tetrahydro[1,1'-binaphthalen]-2-yl ester (9CI) (CA INDEX NAME)



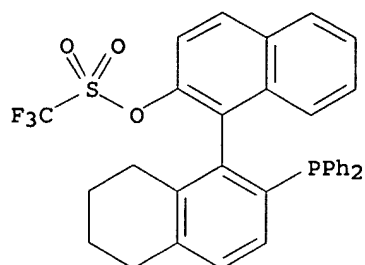
RN 575458-53-6 HCAPLUS

CN Methanesulfonic acid, trifluoro-, (1S)-2'-(dicyclohexylphosphino)-5',6',7',8'-tetrahydro[1,1'-binaphthalen]-2-yl ester (9CI) (CA INDEX NAME)



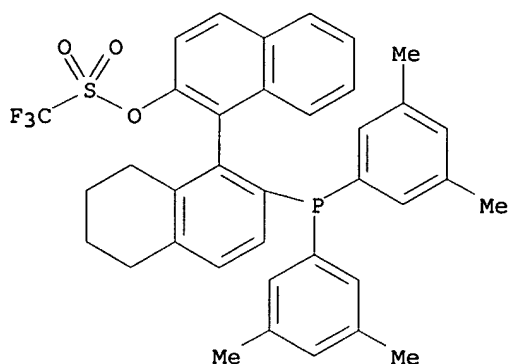
RN 575458-54-7 HCAPLUS

CN Methanesulfonic acid, trifluoro-, (1S)-2'-(diphenylphosphino)-5',6',7',8'-tetrahydro[1,1'-binaphthalen]-2-yl ester (9CI) (CA INDEX NAME)



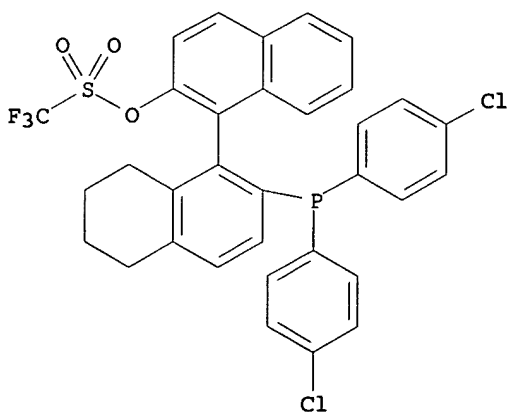
RN 575458-55-8 HCAPLUS

CN Methanesulfonic acid, trifluoro-, (1S)-2'-[bis(3,5-dimethylphenyl)phosphino]-5',6',7',8'-tetrahydro[1,1'-binaphthalen]-2-yl ester (9CI) (CA INDEX NAME)



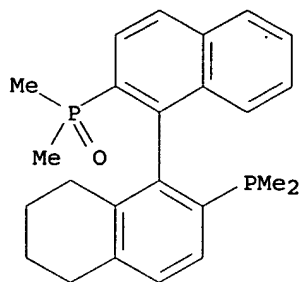
RN 575458-56-9 HCAPLUS

CN Methanesulfonic acid, trifluoro-, (1S)-2'-[bis(4-chlorophenyl)phosphino]-5',6',7',8'-tetrahydro[1,1'-binaphthalen]-2-yl ester (9CI) (CA INDEX NAME)



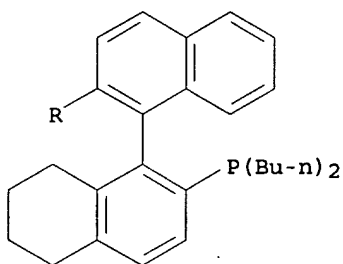
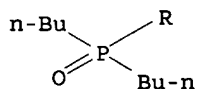
RN 575458-57-0 HCAPLUS

CN Phosphine oxide, [(1S)-2'-(dimethylphosphino)-5',6',7',8'-tetrahydro[1,1'-binaphthalen]-2-yl]dimethyl- (9CI) (CA INDEX NAME)



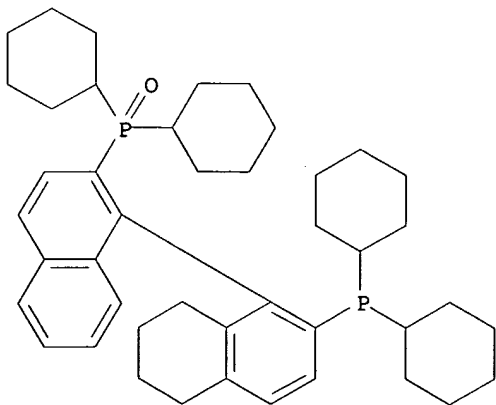
RN 575458-58-1 HCAPLUS

CN Phosphine oxide, dibutyl[(1S)-2'-(dibutylphosphino)-5',6',7',8'-tetrahydro[1,1'-binaphthalen]-2-yl]- (9CI) (CA INDEX NAME)



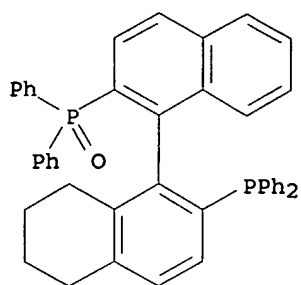
RN 575458-59-2 HCAPLUS

CN Phosphine oxide, dicyclohexyl[(1S)-2'-(dicyclohexylphosphino)-5',6',7',8'-tetrahydro[1,1'-binaphthalen]-2-yl]- (9CI) (CA INDEX NAME)

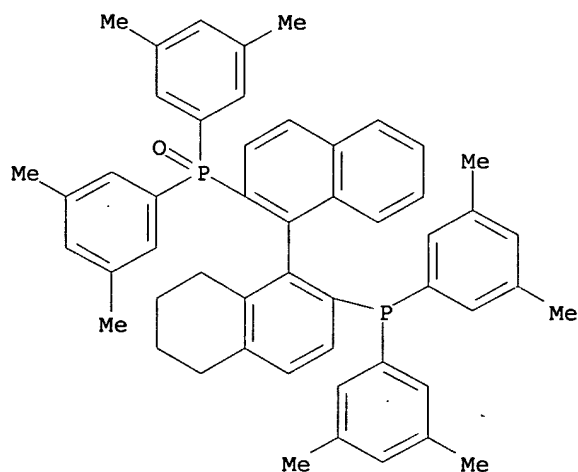


RN 575458-60-5 HCAPLUS

CN Phosphine oxide, [(1S)-2'-(diphenylphosphino)-5',6',7',8'-tetrahydro[1,1'-binaphthalen]-2-yl]diphenyl- (9CI) (CA INDEX NAME)

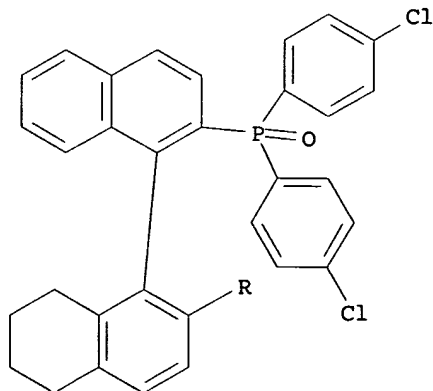


RN 575458-61-6 HCAPLUS  
 CN Phosphine oxide, [(1S)-2'-[bis(3,5-dimethylphenyl)phosphino]-5',6',7',8'-tetrahydro[1,1'-binaphthalen]-2-yl]bis(3,5-dimethylphenyl)- (9CI) (CA INDEX NAME)

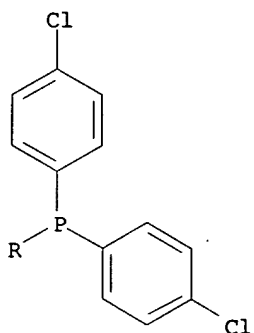


RN 575458-62-7 HCAPLUS  
 CN Phosphine oxide, [(1S)-2'-[bis(4-chlorophenyl)phosphino]-5',6',7',8'-tetrahydro[1,1'-binaphthalen]-2-yl]bis(4-chlorophenyl)- (9CI) (CA INDEX NAME)

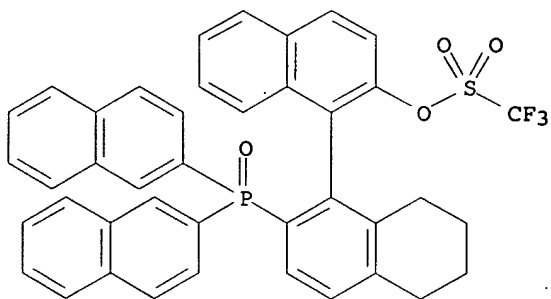
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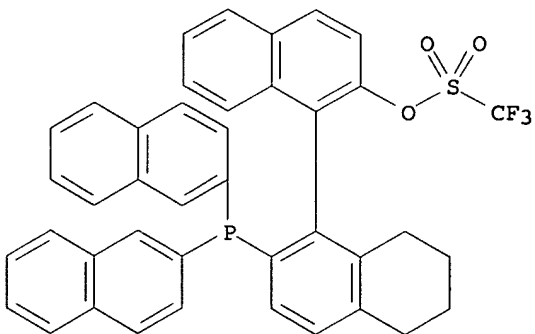
PAGE 2-A



RN 575458-70-7 HCAPLUS  
 CN Methanesulfonic acid, trifluoro-, (1R)-2'-(di-2-naphthalenylphosphinyl)-5',6',7',8'-tetrahydro[1,1'-binaphthalen]-2-yl ester (9CI) (CA INDEX NAME)

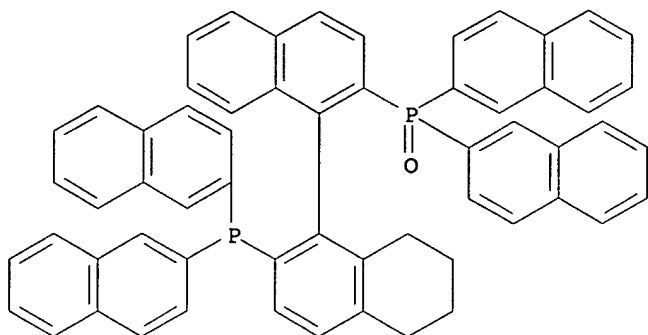


RN 575458-71-8 HCAPLUS  
 CN Methanesulfonic acid, trifluoro-, (1R)-2'-(di-2-naphthalenylphosphino)-5',6',7',8'-tetrahydro[1,1'-binaphthalen]-2-yl ester (9CI) (CA INDEX NAME)



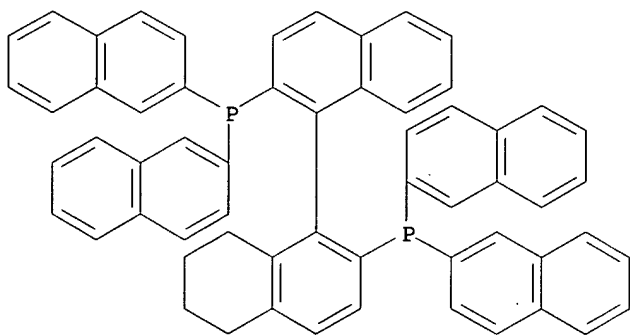
RN 575458-72-9 HCAPLUS  
 CN Phosphine oxide, [(1R)-2'-(di-2-naphthalenylphosphino)-5',6',7',8'-tetrahydro[1,1'-binaphthalen]-2-yl]di-2-naphthalenyl- (9CI) (CA INDEX NAME)





RN 575458-73-0 HCAPLUS

CN Phosphine, [(1R)-5,6,7,8-tetrahydro[1,1'-binaphthalene]-2,2'-diyl]bis[di-2-naphthalenyl- (9CI) (CA INDEX NAME)]



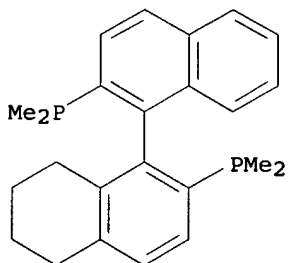
IT 575458-63-8P 575458-64-9P 575458-65-0P

575458-66-1P 575458-67-2P 575458-68-3P

RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. of chiral diphosphine ligands with non-C2 symmetry axis  
and their application)

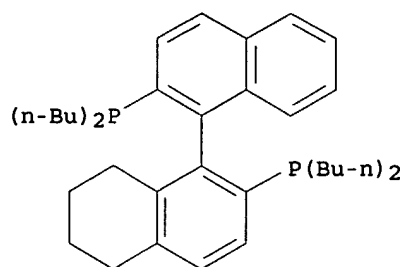
RN 575458-63-8 HCAPLUS

CN Phosphine, [(1S)-5,6,7,8-tetrahydro[1,1'-binaphthalene]-2,2'-diyl]bis[dimethyl- (9CI) (CA INDEX NAME)]

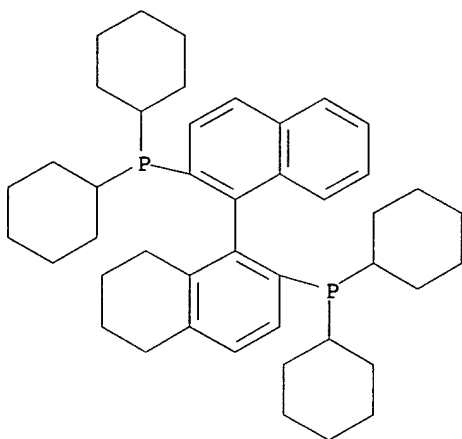


RN 575458-64-9 HCAPLUS

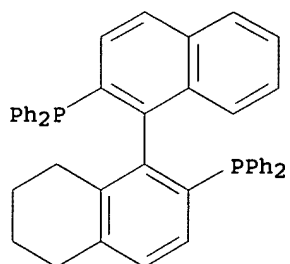
CN Phosphine, [(1S)-5,6,7,8-tetrahydro[1,1'-binaphthalene]-2,2'-diyl]bis[dibutyl- (9CI) (CA INDEX NAME)]



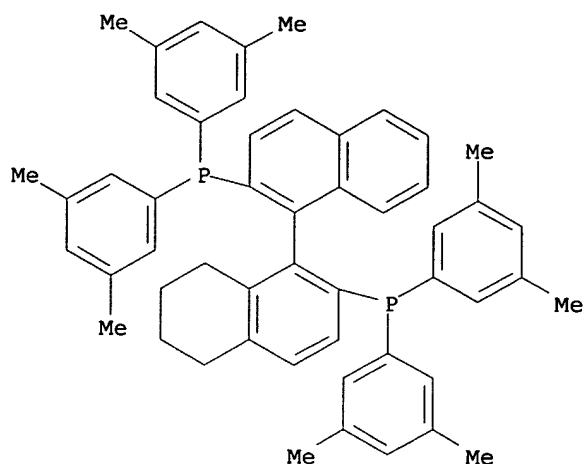
RN 575458-65-0 HCAPLUS  
 CN Phosphine, [(1S)-5,6,7,8-tetrahydro[1,1'-binaphthalene]-2,2'-diyl]bis[dicyclohexyl]- (9CI) (CA INDEX NAME)



RN 575458-66-1 HCAPLUS  
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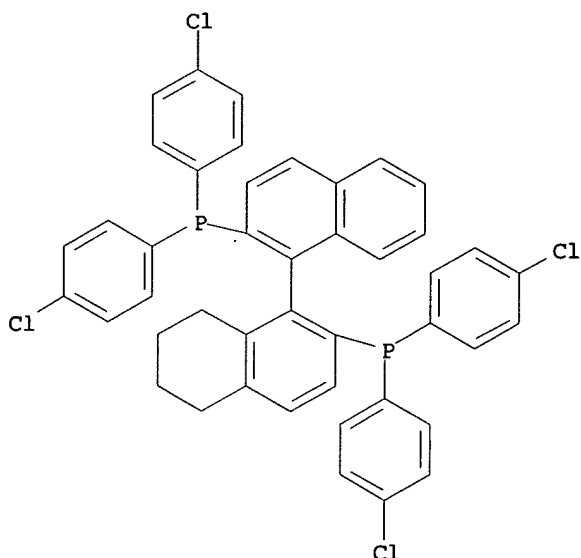


RN 575458-67-2 HCAPLUS  
 CN Phosphine, [(1S)-5,6,7,8-tetrahydro[1,1'-binaphthalene]-2,2'-diyl]bis[bis(3,5-dimethylphenyl)- (9CI) (CA INDEX NAME)



RN 575458-68-3 HCAPLUS

CN Phosphine, [(1S)-5,6,7,8-tetrahydro[1,1'-binaphthalene]-2,2'-diyl]bis[bis(4-chlorophenyl)- (9CI) (CA INDEX NAME)



IC ICM C07F009-28

ICS B01J031-24

CC 29-7 (Organometallic and Organometalloidal Compounds)

IT Ligands

RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)

(prepn. of chiral diphosphine ligands with non-C2 symmetry axis and their application in asym. hydrogenation)

IT 575458-74-1P

RL: CAT (Catalyst use); SPN (Synthetic preparation);

PREP (Preparation); USES (Uses)

(prepn. of chiral diphosphine ligands

with non-C2 symmetry axis and their application)

IT 142128-92-5P, (S)-2,2'-Bis(methoxymethoxy)[1,1'-binaphthyl]

329321-01-9P 575451-03-5P 575458-43-4P 575458-44-5P

575458-45-6P 575458-46-7P 575458-47-8P  
 575458-48-9P 575458-49-0P 575458-50-3P  
 575458-51-4P 575458-52-5P 575458-53-6P  
 575458-54-7P 575458-55-8P 575458-56-9P  
 575458-57-0P 575458-58-1P 575458-59-2P  
 575458-60-5P 575458-61-6P 575458-62-7P  
 575458-70-7P 575458-71-8P 575458-72-9P  
 575458-73-0P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
 (prepn. of chiral diphosphine ligands with non-C2 symmetry axis and their application)

IT 575458-63-8P 575458-64-9P 575458-65-0P  
 575458-66-1P 575458-67-2P 575458-68-3P

RL: SPN (Synthetic preparation); PREP (Preparation)  
 (prepn. of chiral diphosphine ligands with non-C2 symmetry axis and their application)

L26 ANSWER 17 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2003:639088 HCAPLUS

DOCUMENT NUMBER: 139:172690

TITLE: Preparation of metal complexes of chiral diphosphine ligand with non-C2 symmetry axis and their application in asymmetric catalytic hydrogenation of ketones

INVENTOR(S): Ding, Kuiling; Shen, Xiaoqiang; Li, Xin

PATENT ASSIGNEE(S): Shanghai Inst. of Organic Chemistry, Chinese Academy of Sciences, Peop. Rep. China

SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 20 pp.

CODEN: CNXXEV

DOCUMENT TYPE: Patent

LANGUAGE: Chinese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 1356334	A	20020703	CN 2001-139087	20011207

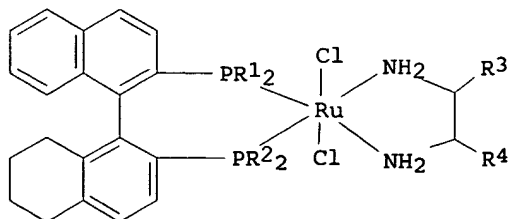
PRIORITY APPLN. INFO.:

<--  
 CN 2001-139087

20011207

OTHER SOURCE(S):  
 GI

<--  
 CASREACT 139:172690; MARPAT 139:172690



I

AB Title compds. I (R1, R2 = alkyl, cloalkyl, 1-naphthyl, 2-naphthyl, etc; R3, R4 = H, Ph, Me, Et, iso-Pr, ethylphenyl, or 4-methoxyphenyl; R3R4 = tetramethylene) were prepd. by the reaction

of ruthenium compds. such as  $(\text{RuCl}_2\text{Ph})_2$  with chiral diphosphine ligand and diamine in polar org. solvent. The Ru complex may be used as catalyst for the asym. hydrogenation of ketones. Some arom. ketones (such as acetophenone, benzophenone, 2-acetylpyridine, 2-acetylthiophene, etc.) and some unsatd. arom. ketones (such as 3,6,6-trimethyl-4-cyclohexenone, 1-phenyl-4-penten-1-one, etc.) were asym. hydrogenated using the Ru complex.

IT 574751-89-6P 574751-90-9P 574751-91-0P

574751-92-1P 574751-93-2P

RL: CAT (Catalyst use); SPN (Synthetic preparation);

PREP (Preparation); USES (Uses)

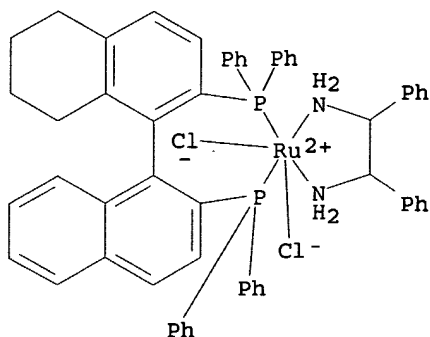
(prepn. of metal complexes of chiral

diphosphine ligand with non-C2 symmetry axis

and their application in asym. catalytic hydrogenation of ketones)

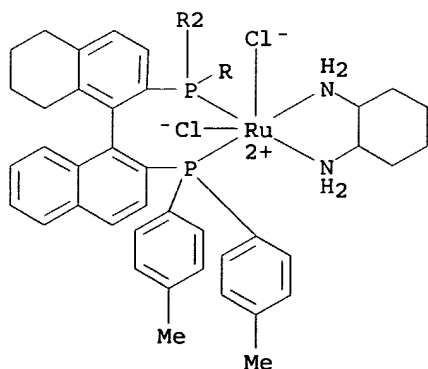
RN 574751-89-6 HCAPLUS

CN Ruthenium, dichloro[(1S,2S)-1,2-diphenyl-1,2-ethanediamine- $\kappa\text{N},\kappa\text{N}'$ ][[(1S)-5,6,7,8-tetrahydro[1,1'-binaphthalene]-2,2'-diyl]bis[diphenylphosphine- $\kappa\text{P}$ ]]-, (OC-6-14)- (9CI) (CA INDEX NAME)



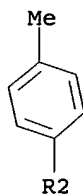
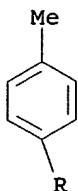
RN 574751-90-9 HCAPLUS

CN Ruthenium, dichloro[(1S,2S)-1,2-cyclohexanediamine- $\kappa\text{N},\kappa\text{N}'$ ][[(1S)-5,6,7,8-tetrahydro[1,1'-binaphthalene]-2,2'-diyl]bis[bis(4-methylphenyl)phosphine- $\kappa\text{P}$ ]]-, (OC-6-14)- (9CI) (CA INDEX NAME)



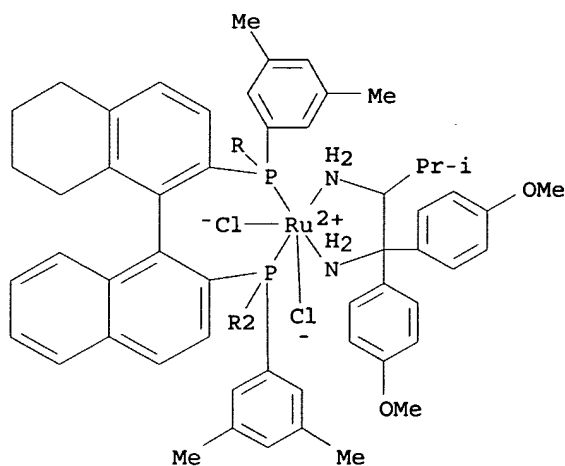
PAGE 1-A

PAGE 2-A

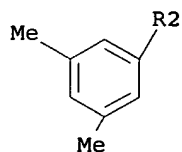
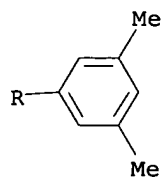


RN 574751-91-0 HCAPLUS  
 CN Ruthenium, [1,1-bis(4-methoxyphenyl)-3-methyl-1,2-butanediamine- $\kappa N, \kappa N'$ ]dichloro[(5,6,7,8-tetrahydro[1,1'-binaphthalene]-2,2'-diyl)bis[bis(3,5-dimethylphenyl)phosphine- $\kappa P$ ]]-, (OC-6-14)- (9CI) (CA INDEX NAME)

PAGE 1-A

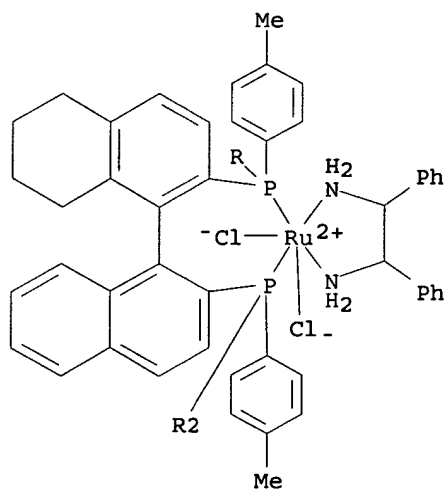


PAGE 2-A

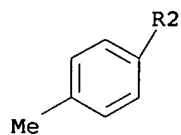
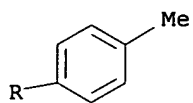


RN 574751-92-1 HCAPLUS  
 CN Ruthenium, dichloro[(1S,2S)-1,2-diphenyl-1,2-ethanediamine- $\kappa N, \kappa N'$ ][[(1S)-5,6,7,8-tetrahydro[1,1'-binaphthalene]-2,2'-diyl]bis[bis(4-methylphenyl)phosphine- $\kappa P$ ]]-, (OC-6-14)-(9CI) (CA INDEX NAME)

PAGE 1-A

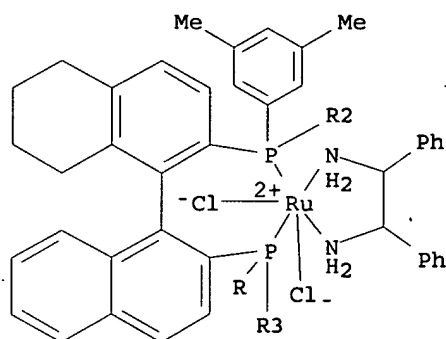


PAGE 2-A

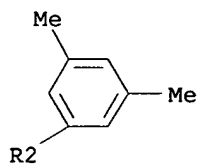
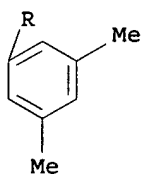


RN 574751-93-2 HCAPLUS  
 CN Ruthenium, dichloro[(1S,2S)-1,2-diphenyl-1,2-ethanediamine- $\kappa$ N, $\kappa$ N'] [[[1S]-5,6,7,8-tetrahydro[1,1'-binaphthalene]-2,2'-diyl]bis[bis(3,5-dimethylphenyl)phosphine- $\kappa$ P]]-,  
 (OC-6-14)- (9CI) (CA INDEX NAME)

PAGE 1-A

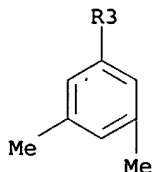


PAGE 2-A





PAGE 3-A



IC ICM C07F009-28  
 ICS C07F015-00; B01J031-24  
 CC 78-7 (Inorganic Chemicals and Reactions)  
 Section cross-reference(s): 25  
 IT 574751-89-6P 574751-90-9P 574751-91-0P  
 574751-92-1P 574751-93-2P  
 RL: CAT (Catalyst use); SPN (Synthetic preparation);  
 PREP (Preparation); USES (Uses)  
 (prepn. of metal complexes of chiral  
 diphosphine ligand with non-C2 symmetry axis  
 and their application in asym. catalytic hydrogenation of  
 ketones)

L26 ANSWER 18 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2003:633720 HCAPLUS  
 DOCUMENT NUMBER: 139:180194  
 TITLE: Process for producing tertiary phosphine having  
 bulky hydrocarbon group bonded  
 INVENTOR(S): Maehara, Shinya; Iwazaki, Hideyuki  
 PATENT ASSIGNEE(S): Hokko Chemical Industry Co., Ltd., Japan  
 SOURCE: PCT Int. Appl., 46 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003066643	A1	20030814	WO 2003-JP1055	20030203
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W: CN, US				
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR				
EP 1473297	A1	20041103	EP 2003-703147	20030203
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R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, FI, CY, TR, BG, CZ, EE, HU, SK				
CN 1628122	A	20050615	CN 2003-803276	20030203
<--				
JP 2003292498	A2	20031015	JP 2003-27287	20030204
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JP 2003313194	A2	20031106	JP 2003-27288	20030204

US 2006020148

A1

20060126

US 2004-503577

200408  
04

PRIORITY APPLN. INFO.:

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JP 2002-26490

A

200202  
04<--  
JP 2002-41204

A

200202  
19<--  
WO 2003-JP1055

W

200302  
03

OTHER SOURCE(S):

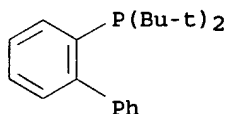
CASREACT 139:180194; MARPAT 139:180194

AB Disclosed is a process by which a high-purity tertiary phosphine having a three-dimensionally bulky hydrocarbon group bonded thereto can be produced in a high yield through a simple and safe procedure on an industrial scale. The process is characterized by reacting a dialkylphosphinous halide of formula R1(R2)P-X (R1, R2 = C3-13 tert-hydrocarbyl; X = Cl, Br) with a Grignard reagent of formula R3MgX1 (R3 = alkyl, alkenyl, alkynyl, cycloalkyl, aralkyl, lower alkoxy-lower alkyl, aryl; X1 = Cl, Br, iodo) in the presence of 0.1 to 5 mol% copper compd. based on the dialkylphosphinous halide to produce a tertiary phosphine represented by the following general formula R1(R2)PR3 (R1, R2, R3 = same as above). Tertiary phosphine is useful as a ligand for a transition metal catalyst in org. synthesis reactions. Thus, a Grignard reagent soln. prepd. from 13.5 g chlorobenzene and 3.5 g mg in 100 mL THF was added dropwise to a mixt. of 18.1 g di-tert-butylphosphinous chloride, 0.14 g CuBr, and 40 mL THF at 25-30° over 1 h, stirred at 35-40° for 3 h, cooled to room temp., and treated with 40 mL toluene and 30 mL 5% aq. H2SO4. The org. layer was sepd., washed with water and dried over anhyd. Na2SO4, followed by distn. of the solvent under reduced pressure and distn. of the product at 5 torr and 110-112° to give 89% di-tert-butylphenylphosphine (19.9 g, 99.0% purity).

IT 224311-51-7P, Di(tert-butyl)(2-phenylphenyl)phosphine  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (process for producing tertiary phosphine having bulky hydrocarbon group bonded by phosphonylation reaction of dialkylphosphinous halide with Grignard reagent in presence of copper halide or copper (II) acetate)

RN 224311-51-7 HCAPLUS

CN Phosphine, [1,1'-biphenyl]-2-ylbis(1,1-dimethylethyl)- (9CI) (CA INDEX NAME)



IC ICM C07F009-50

CC 29-7 (Organometallic and Organometalloidal Compounds)

IT 7447-39-4, Copper(II) chloride, uses 7758-89-6, Copper(I) chloride  
 7787-70-4, Copper(I) bromide 7789-45-9, Copper(II) bromide  
 13395-16-9, Copper(II) acetylacetonate

RL: CAT (Catalyst use); USES (Uses)

(process for producing tertiary phosphine having bulky hydrocarbon group bonded by phosphonylation reaction of

dialkylphosphinous halide with Grignard reagent in presence of copper halide or copper (II) acetate)

IT 6002-40-0P, Di(tert-butyl)methylphosphine 13716-12-6P,  
Tri(tert-butyl)phosphine 25032-48-8P, Di(tert-butyl)ethylphosphine  
25032-49-9P, Di(tert-butyl)isopropylphosphine 27286-19-7P,  
Di(tert-butyl)benzylphosphine 29949-71-1P, Di(tert-  
butyl)butylphosphine 32673-25-9P, Di(tert-butyl)phenylphosphine  
36297-54-8P, Di(tert-butyl)(2-methylphenyl)phosphine 53098-11-6P,  
Di(tert-butyl)(2-methoxyphenyl)phosphine 200352-94-9P,  
Di(tert-butyl)(1-naphthyl)phosphine 224311-51-7P,  
Di(tert-butyl)(2-phenylphenyl)phosphine 578763-02-7P,  
Di(tert-butyl)(2,4,6-trimethylphenyl)phosphine 578763-05-0P,  
Di(tert-amyl)phenylphosphine 578763-08-3P, Di(tert-  
amyl)cyclohexylphosphine

RL: SPN (Synthetic preparation); PREP (Preparation)

(process for producing tertiary phosphine having bulky hydrocarbon group bonded by phosphonylation reaction of dialkylphosphinous halide with Grignard reagent in presence of copper halide or copper (II) acetate)

REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L26 ANSWER 19 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2003:590801 HCAPLUS

DOCUMENT NUMBER: 139:149755

TITLE: Novel phosphine compound,  
transition metal complex  
containing the same phosphine compound  
as ligand and asymmetric  
synthesis catalyst containing the  
complex

INVENTOR(S): Shimizu, Hideo; Saito, Takao

PATENT ASSIGNEE(S): Takasago International Corp., Japan

SOURCE: U.S. Pat. Appl. Publ., 12 pp.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2003144139	A1	20030731	US 2002-330495	20021230
US 6717016	B2	20040406	<--	
JP 2003226696	A2	20030812	JP 2002-23568	20020131
EP 1334976	A1	20030813	EP 2003-290239	20030130
EP 1334976	B1	20060308	<--	
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
AT 319724	E	20060315	AT 2003-290239	20030130
			<--	

PRIORITY APPLN. INFO.:

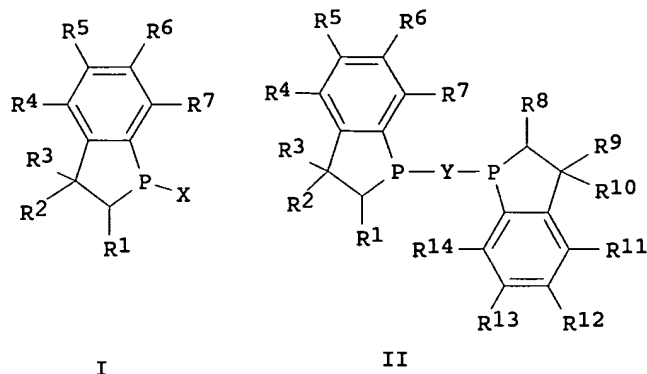
JP 2002-23568 A

200201

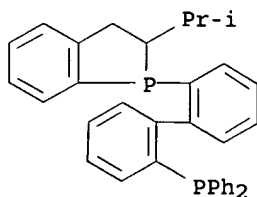
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OTHER SOURCE(S): CASREACT 139:149755; MARPAT 139:149755  
GI

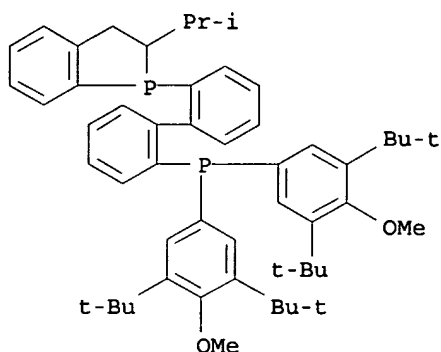


- AB The **prepn.** of **phosphine** compd., I and II (R1, R8 = C1-5 linear or branched alkyl; R2, R3, R9, R10 = represent independently H, C1-5 alkyl, etc.; R4, R5, R6, R7, R11, R12, R13, R14 = independently H, C1-5 alkyl, alkoxy, dialkylamino, R4-R5, R5-R6, R6-R7, R11-R12, R12-R13, R13-R14 = taken together with C atoms to which they are attached form a ring or fused ring, X, Y = functional group that forms a stable bond with P), a **transition metal** complex having the **phosphine** compd. as a **ligand** and a **catalyst** for **asym. hydrogenation** including the **transition metal** complex, is described. Thus, reaction of (+)-1,2-bis(2-isopropyl-2,3-dihydroxy-1H-phosphindol-1-yl)benzene ((+)-iPr-BeePHOS, **prepn.** given) with [Rh(COD)<sub>2</sub>]OTf gave 81% [Rh(COD)((+)-iPr-BeePHOS)]OTf which catalyzed the **asym. hydrogenation** of Me N-acetamidocinnamate.
- IT 569650-32-4P 569650-33-5P 569650-36-8P 569650-44-8P  
RL: CAT (Catalyst use); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)  
(prepn. of phosphine compd. and their transition metal complex as catalyst for **asym. hydrogenation**)
- RN 569650-32-4 HCAPLUS  
CN 1H-Phosphindole, 1-[2'-(diphenylphosphino)[1,1'-biphenyl]-2-yl]-2,3-dihydro-2-(1-methylethyl)- (9CI) (CA INDEX NAME)



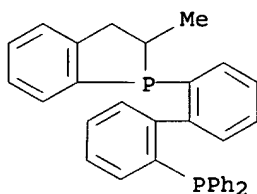
- RN 569650-33-5 HCAPLUS  
CN 1H-Phosphindole, 1-[2'-[bis[3,5-bis(1,1-dimethylethyl)-4-

methoxyphenyl]phosphino)[1,1'-biphenyl]-2-yl]-2,3-dihydro-2-(1-methylethyl)- (9CI) (CA INDEX NAME)



RN 569650-36-8 HCAPLUS

CN 1H-Phosphindole, 1-[2'-(diphenylphosphino)[1,1'-biphenyl]-2-yl]-2,3-dihydro-2-methyl- (9CI) (CA INDEX NAME)



RN 569650-44-8 HCAPLUS

CN Ruthenium(1+), chloro[1-[2'-(diphenylphosphino-κP)[1,1'-biphenyl]-2-yl]-2,3-dihydro-2-methyl-1H-phosphindole-κP][(1,2,3,4,5,6-η)-1-methyl-4-(1-methylethyl)benzene]-, chloride (9CI) (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

IT 569650-38-0P 569650-40-4P 569650-42-6P

569650-43-7P 569650-45-9P

RL: CAT (Catalyst use); SPN (Synthetic preparation);

PREP (Preparation); USES (Uses)

(prepn. of phosphine compd. and their transition metal complex as catalyst for asym. hydrogenation)

RN 569650-38-0 HCAPLUS

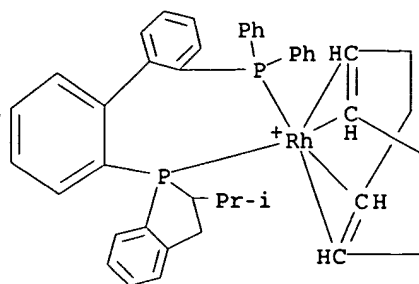
CN Rhodium(1+), [(1,2,5,6-η)-1,5-cyclooctadiene][1-[2'-(diphenylphosphino-κP)[1,1'-biphenyl]-2-yl]-2,3-dihydro-2-(1-methylethyl)-1H-phosphindole-κP]-, salt with trifluoromethanesulfonic acid (1:1) (9CI) (CA INDEX NAME)

CM 1

CRN 569650-37-9

CMF C43 H44 P2 Rh

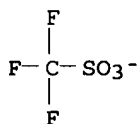
CCI CCS



CM 2

CRN 37181-39-8

CMF C F3 O3 S



RN 569650-40-4 HCAPLUS

CN Rhodium(1+), [1-[2'-[bis[3,5-bis(1,1-dimethylethyl)-4-methoxyphenyl]phosphino-κP][1,1'-biphenyl]-2-yl]-2,3-dihydro-1H-phosphindole-κP][(1,2,5,6-η)-1,5-cyclooctadiene]-, salt with trifluoromethanesulfonic acid (1:1) (9CI) (CA INDEX NAME)

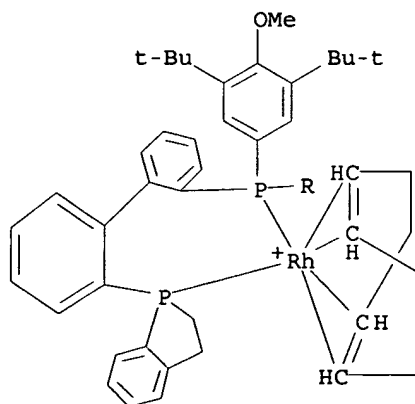
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CRN 569650-39-1

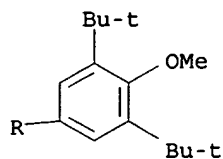
CMF C58 H74 O2 P2 Rh

CCI CCS

PAGE 1-A



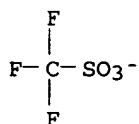
PAGE 2-A



CM 2

CRN 37181-39-8

CMF C F3 O3 S



RN 569650-42-6 HCAPLUS

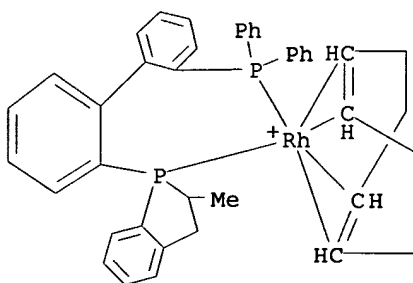
CN Rhodium(1+), [(1,2,5,6-η)-1,5-cyclooctadiene] [1-[2'-(diphenylphosphino-κP) [1,1'-biphenyl]-2-yl]-2,3-dihydro-2-methyl-1H-phosphindole-κP]-, salt with trifluoromethanesulfonic acid (1:1) (9CI) (CA INDEX NAME)

CM 1

CRN 569650-41-5

CMF C41 H40 P2 Rh

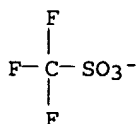
CCI CCS



CM 2

CRN 37181-39-8

CMF C F3 O3 S



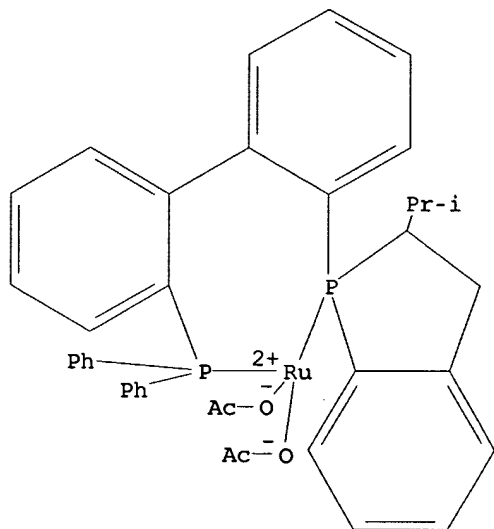
RN 569650-43-7 HCAPLUS

CN Ruthenium(1+), chloro[1-[2'-(diphenylphosphino-κP)[1,1'-biphenyl]-2-yl]-2,3-dihydro-2-(1-methylethyl)-1H-phosphindole-κP][(1,2,3,4,5,6-η)-1-methyl-4-(1-methylethyl)benzene]-, chloride (9CI) (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

RN 569650-45-9 HCAPLUS

CN Ruthenium, bis(acetato-κO)[1-[2'-(diphenylphosphino-κP)[1,1'-biphenyl]-2-yl]-2,3-dihydro-2-(1-methylethyl)-1H-phosphindole-κP]- (9CI) (CA INDEX NAME)



IC ICM C07F009-02

ICS B01J031-00

INCL 502162000; 568012000; 556013000

CC 29-7 (Organometallic and Organometalloidal Compounds)

Section cross-reference(s): 25

ST phosphine ligand prepn

transition metal complex catalyzed asym

hydrogenation; phosphindolyl arene prepn rhodium

complexation asym hydrogenation

IT Phosphines

RL: CAT (Catalyst use); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)

(prepn. of phosphine compd. and their transition metal complex as catalyst for asym. hydrogenation)

IT 346457-41-8

RL: CAT (Catalyst use); USES (Uses)

(prepn. of phosphine compd. and their transition metal complex as catalyst for asym. hydrogenation)

IT 549514-63-8P 549529-04-6P 549529-05-7P 569650-32-4P

569650-33-5P 569650-36-8P 569650-44-8P

RL: CAT (Catalyst use); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)

(prepn. of phosphine compd. and their transition metal complex as catalyst for asym. hydrogenation)

IT 549514-54-7P 549514-96-7P 569650-38-0P

569650-40-4P 569650-42-6P 569650-43-7P

569650-45-9P 569673-75-2P 569674-36-8P

RL: CAT (Catalyst use); SPN (Synthetic preparation);

PREP (Preparation); USES (Uses)



(prepn. of phosphine compd. and their transition metal complex as catalyst for asym. hydrogenation)

REFERENCE COUNT: 10 THERE ARE 10 CITED REFERENCES AVAILABLE  
FOR THIS RECORD. ALL CITATIONS AVAILABLE  
IN THE RE FORMAT

L26 ANSWER 20 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2003:580424 HCAPLUS

DOCUMENT NUMBER: 139:307577

TITLE: Chiral fluorous phosphorus ligands based on the  
binaphthyl skeleton: synthesis and applications  
in asymmetric catalysis

AUTHOR(S): Bayardon, Jerome; Cavazzini, Marco; Maillard,  
David; Pozzi, Gianluca; Quici, Silvio; Sinou,  
Denis

CORPORATE SOURCE: CPE Lyon, Laboratoire de Synthese Asymetrique,  
associe au CNRS, Universite Claude Bernard Lyon  
1, Villeurbanne, 69622, Fr.

SOURCE: Tetrahedron: Asymmetry (2003), 14(15),  
2215-2224

CODEN: TASYE3; ISSN: 0957-4166

PUBLISHER: Elsevier Science B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

OTHER SOURCE(S): CASREACT 139:307577

AB Two enantiopure fluorous phosphines have been conveniently  
synthesized by combining palladium-catalyzed coupling reactions of  
easily available binaphthyl building blocks with the introduction of  
fluorous ponytails onto arom. compds. via ether bond formation.  
These new fluorous chiral phosphines have been tested as ligands in  
metal-catalyzed asym. transformations, the best results being  
obtained in the palladium-catalyzed asym. allylic substitution of  
1,3-diphenyl-2-propenyl acetate, affording products with up to 87%  
e.e.

IT 365240-77-3P 372152-06-2P

RL: CAT (Catalyst use); SPN (Synthetic preparation);

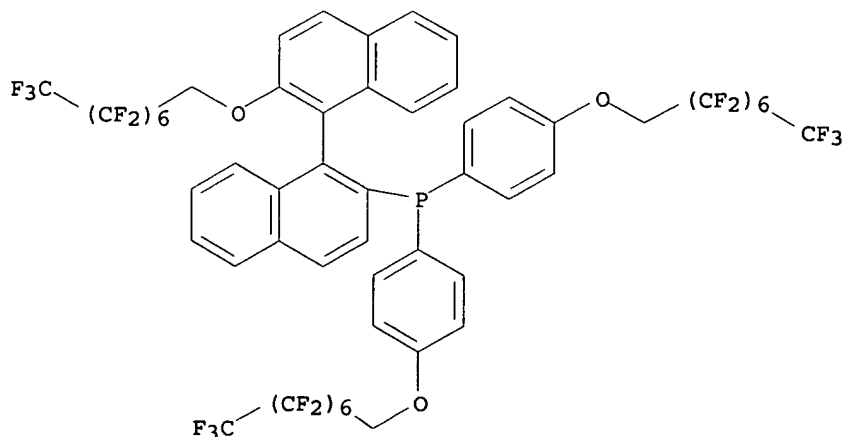
PREP (Preparation); USES (Uses)

(prepn. of chiral fluorous phosphine

ligands based on binaphthyl skeleton for asym. catalysis)

RN 365240-77-3 HCAPLUS

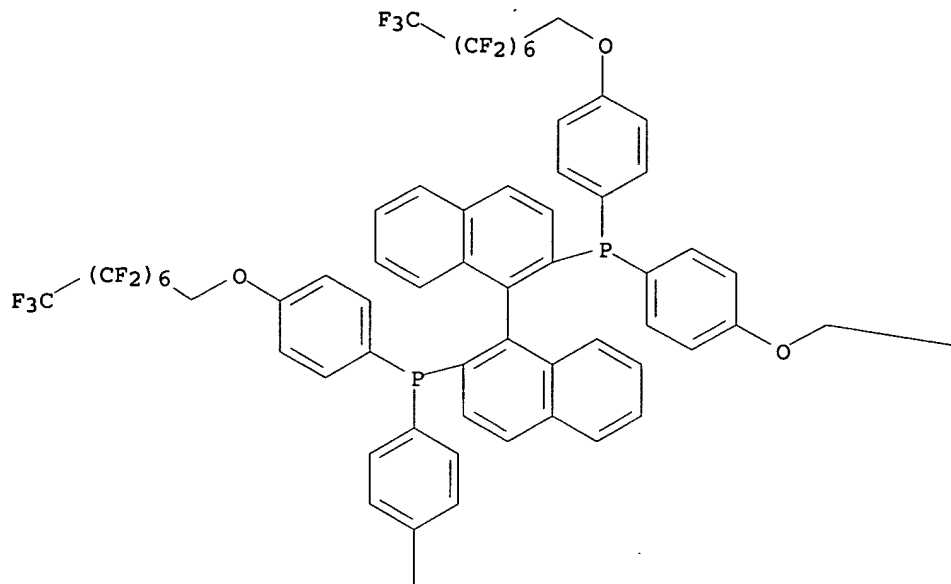
CN Phosphine, [(1R)-2'-[(2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-  
pentadecafluorooctyl)oxy][1,1'-binaphthalen]-2-yl]bis[4-  
[(2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluorooctyl)oxy]phenyl]-  
(9CI) (CA INDEX NAME)



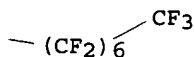
RN 372152-06-2 HCAPLUS

CN Phosphine, (1R)-[1,1'-binaphthalene]-2,2'-diylbis[bis[4-[(2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluorooctyl)oxy]phenyl]-(9CI) (CA INDEX NAME)

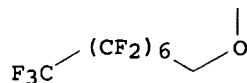
PAGE 1-A



PAGE 1-B



PAGE 2-A



CC 25-18 (Benzene, Its Derivatives, and Condensed Benzenoid Compounds)  
 Section cross-reference(s): 29  
 IT 365240-77-3P 372152-06-2P  
 RL: CAT (Catalyst use); SPN (Synthetic preparation);  
 PREP (Preparation); USES (Uses)  
 (prepn. of chiral fluorous phosphine  
 ligands based on binaphthyl skeleton for asym. catalysis)

REFERENCE COUNT: 40 THERE ARE 40 CITED REFERENCES AVAILABLE  
FOR THIS RECORD. ALL CITATIONS AVAILABLE  
IN THE RE FORMAT

L26 ANSWER 21 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2003:514194 HCAPLUS

DOCUMENT NUMBER: 139:214576

TITLE: Palladium-Catalyzed Asymmetric Phosphination.  
Enantioselective Synthesis of PAMP-BH<sub>3</sub>, Ligand  
Effects on Catalysis, and Direct Observation of  
the Stereochemistry of Transmetalation and  
Reductive Elimination

AUTHOR(S): Moncarz, Jillian R.; Brunker, Tim J.; Jewett,  
John C.; Orchowski, Michael; Glueck, David S.;  
Sommer, Roger D.; Lam, Kin-Chung; Incarvito,  
Christopher D.; Concolino, Thomas E.;  
Ceccarelli, Christopher; Zakharov, Lev N.;  
Rheingold, Arnold L.

CORPORATE SOURCE: Burke Laboratory, Department of Chemistry,  
Dartmouth College, Hanover, NH, 03755, USA

SOURCE: Organometallics (2003), 22(16),  
3205-3221

CODEN: ORGND7; ISSN: 0276-7333

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

OTHER SOURCE(S): CASREACT 139:214576

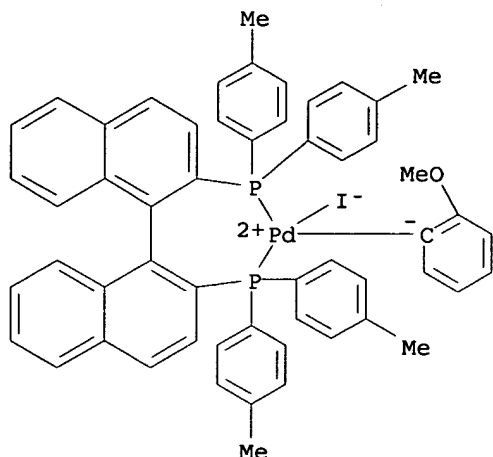
AB The complexes Pd(diphos)(o-An)(I) [o-An = o-MeOC<sub>6</sub>H<sub>4</sub>; diphos = dppe  
(3), (S,S)-Chiraphos (4), (R,R)-Me-Duphos (5), (R,S)-tert-Bu-  
Josiphos (6), (R)-Tol-Binap (7)] were prepd. Complex 6 catalyzed  
the coupling of PH(Me)(Ph)(BH<sub>3</sub>) (2) with o-MeOC<sub>6</sub>H<sub>4</sub>I in the presence  
of base to yield PAMP-BH<sub>3</sub> [(Me)(Ph)(o-An)(BH<sub>3</sub>) (1)] in low  
enantioimeric excess. Stoichiometric reactions of 3-7 with 2 and  
NaOSiMe<sub>3</sub> depended on the diphosphine ligand. Complexes 6 and 7 gave  
PAMP-BH<sub>3</sub> (1) and Pd(0) species; no intermediates were obsd. With 3,  
the intermediate Pd(dppe)(o-An)[P(Me)(Ph)(BH<sub>3</sub>)] (10) was obsd. by  
31P NMR, while 4 gave the isolable diastereomeric Pd complexes  
(SP)-Pd[(S,S)-Chiraphos](o-An)[P(Me)(Ph)(BH<sub>3</sub>)] (11a) and  
(RP)-Pd[(S,S)-Chiraphos](o-An)[P(Me)(Ph)(BH<sub>3</sub>)] (11b), whose abs.  
configurations were detd. by x-ray crystallog. after sepn. The  
analogous Pd[(R,R)-Me-Duphos](o-An)[P(Me)(Ph)(BH<sub>3</sub>)] diastereomers  
(12a,b) were also sepd. and isolated. Treatment of 4 with highly  
enantioenriched 2 (R or S) gave 11a or 11b in high diastereomeric  
excess with retention of configuration at P. P-C reductive  
elimination from either isomer of highly diastereoenriched 11 in the  
presence of excess diphenylacetylene yielded Pd[(S,S)-  
Chiraphos](PhC.tplbond.CPh) (14) and highly enantioenriched PAMP-BH<sub>3</sub>  
(1), with retention of configuration.

IT 586945-07-5P

RL: CAT (Catalyst use); PEP (Physical, engineering or  
chemical process); PYP (Physical process); RCT (Reactant); SPN  
(Synthetic preparation); PREP (Preparation); PROC  
(Process); RACT (Reactant or reagent); USES (Uses)  
(rotational barrier; palladium-catalyzed asym. **prepn.**  
of anisyl(methyl)(phenyl)phosphine-borane,  
ligand effects on catalysis and stereochem. of  
transmetalation and reductive elimination)

RN 586945-07-5 HCAPLUS

CN Palladium, [(1R)-[1,1'-binaphthalene]-2,2'-diylbis[bis(4-  
methylphenyl)phosphine-κP]]iodo(2-methoxyphenyl)-, (SP-4-2)-  
(9CI) (CA INDEX NAME)



CC 29-13 (Organometallic and Organometalloidal Compounds)

Section cross-reference(s): 75

IT 586945-07-5P

RL: CAT (Catalyst use); PEP (Physical, engineering or chemical process); PYP (Physical process); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); PROC (Process); RACT (Reactant or reagent); USES (Uses) (rotational barrier; palladium-catalyzed asym. **prepn.** of anisyl(methyl)(phenyl)phosphine-borane, **ligand** effects on catalysis and stereochem. of transmetalation and reductive elimination)

REFERENCE COUNT: 89 THERE ARE 89 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L26 ANSWER 22 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2003:454336 HCAPLUS

DOCUMENT NUMBER: 139:36635

TITLE: Preparation of aryl diphosphine chiral ligands and their ruthenium complexes for asymmetric catalysis

INVENTOR(S): Malan, Christophe Guillaume; Zanotti-Gerosa, Antonio; Henschke, Julian Paul

PATENT ASSIGNEE(S): Chirotech Technology Limited, UK

SOURCE: PCT Int. Appl., 30 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003048173	A1	20030612	WO 2002-IB5820	20021205

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, YU, ZA, ZM, ZW

RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ,  
 BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK,  
 EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SI, SK,  
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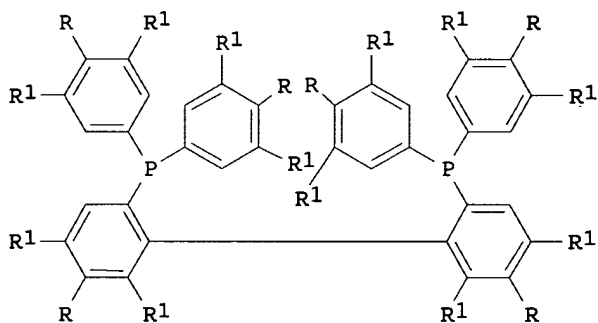
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 US 2005043556 A1 20050224 US 2004-493990 200404  
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 PRIORITY APPLN. INFO.: GB 2001-29112 A 200112  
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 WO 2002-IB5820 W 200212  
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 OTHER SOURCE(S): CASREACT 139:36635; MARPAT 139:36635  
 GI



I

AB The present invention is based around the discoveries that novel ligands I (R = H, alkyl, alkoxy, aryl, heteroaryl, N-alkyl, N-aryl, S-alkyl, S-aryl, OSi(alkyl)3, OSi(aryl)3, F, Cl; R1 = alkyl, etc.), and the opposite enantiomers thereof, (i) have utility as components of catalysts for asym. hydrogenation and (ii) are readily accessible by an efficient general synthetic route. In particular, ruthenium-diamine complexes of I are highly active and selective catalysts for the asym. hydrogenation of ketones. Thus, RuCl2[(R)-4,4',6,6'-tetramethyl-2,2'-bis[bis(3,5-dimethylphenyl)phosphino]biphenyl][ethylenediamine] was prepd. and used as enantioselective hydrogenation catalyst for PhCHO.

IT 540744-40-9P 540744-43-2P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent) (decomplexation; prepn. of aryl diphosphine chiral ligands and their transition

metal complexes for asym. hydrogenation catalysis)

RN 540744-40-9 HCAPLUS  
 CN Palladium(1+), [2-[(1R)-1-(amino-κN)ethyl]phenyl-  
 κC][[(1S)-4,4',6,6'-tetramethyl[1,1'-biphenyl]-2,2'-  
 diyl]bis[bis(3,5-dimethylphenyl)phosphine-κP]]-, (SP-4-3)-,  
 tetrafluoroborate(1-) (9CI) (CA INDEX NAME)

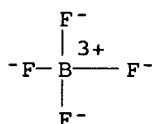
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CRN 540744-39-6  
 CMF C56 H62 N P2 Pd  
 CCI CCS

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

CM 2

CRN 14874-70-5  
 CMF B F4  
 CCI CCS



RN 540744-43-2 HCAPLUS  
 CN Palladium(1+), [2-[(1R)-1-(amino-κN)ethyl]phenyl-  
 κC][[(1R)-4,4',6,6'-tetramethyl[1,1'-biphenyl]-2,2'-  
 diyl]bis[bis(3,5-dimethylphenyl)phosphine-κP]]-, (SP-4-3)-,  
 tetrafluoroborate(1-) (9CI) (CA INDEX NAME)

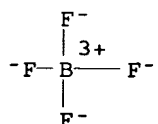
CM 1

CRN 540744-42-1  
 CMF C56 H62 N P2 Pd  
 CCI CCS

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

CM 2

CRN 14874-70-5  
 CMF B F4  
 CCI CCS



IT 540743-33-7P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP  
 (Preparation); RACT (Reactant or reagent)  
 (optical resolu.; prepn. of aryl diphosphine  
 chiral ligands and their transition  
 metal complexes for asym. hydrogenation catalysis)

RN 540743-33-7 HCAPLUS  
 CN Palladium(1+), [2-[(1R)-1-(amino-κN)ethyl]phenyl-  
 κC][[(4,4',6,6'-tetramethyl[1,1'-biphenyl]-2,2'-

diyl)bis[bis(3,5-dimethylphenyl)phosphine-κP]]-, (SP-4-3)-, tetrafluoroborate(1-) (9CI) (CA INDEX NAME)

CM 1

CRN 540743-32-6

CMF C56 H62 N P2 Pd

CCI CCS

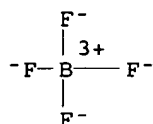
\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

CM 2

CRN 14874-70-5

CMF B F4

CCI CCS



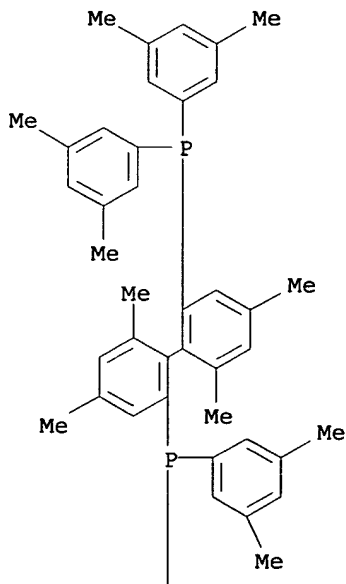
IT 540743-31-5P 540743-40-6P 540744-26-1P  
540744-27-2P 540744-28-3P 540744-48-7P  
RL: CAT (Catalyst use); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)

(prepn. of aryl diphosphine chiral ligands and their transition metal complexes for asym. hydrogenation catalysis)

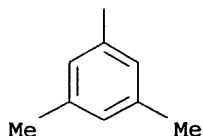
RN 540743-31-5 HCAPLUS

CN Phosphine, (4,4',6,6'-tetramethyl[1,1'-biphenyl]-2,2'-diyl)bis[bis(3,5-dimethylphenyl)- (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 2-A



RN 540743-40-6 HCAPLUS  
 CN Palladium(1+), [2-[(1R)-1-(amino-κN)ethyl]phenyl-κC] [[(1S)-5,5'-dimethoxy-4,4',6,6'-tetramethyl[1,1'-biphenyl]-2,2'-diyl]bis[bis(4-methoxy-3,5-dimethylphenyl)phosphine-κP]]-, (SP-4-3)-, tetrafluoroborate(1-) (9CI) (CA INDEX NAME)

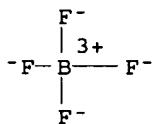
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CRN 540743-39-3  
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 CCI CCS

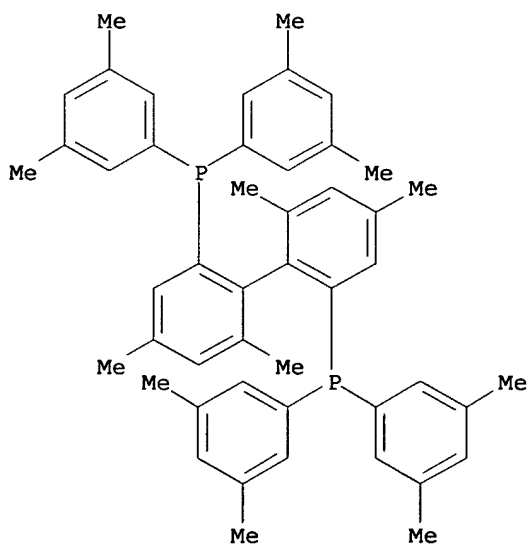
\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

CM 2

CRN 14874-70-5  
 CMF B F4  
 CCI CCS



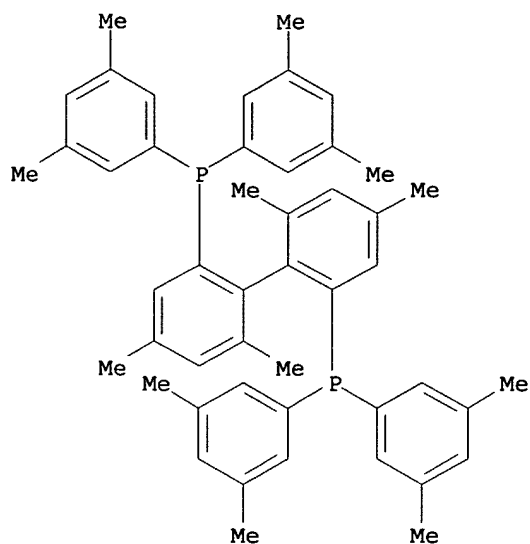
RN 540744-26-1 HCAPLUS  
 CN Phosphine, [(1S)-4,4',6,6'-tetramethyl[1,1'-biphenyl]-2,2'-diyl]bis[bis(3,5-dimethylphenyl)- (9CI) (CA INDEX NAME)]



RN 540744-27-2 HCAPLUS

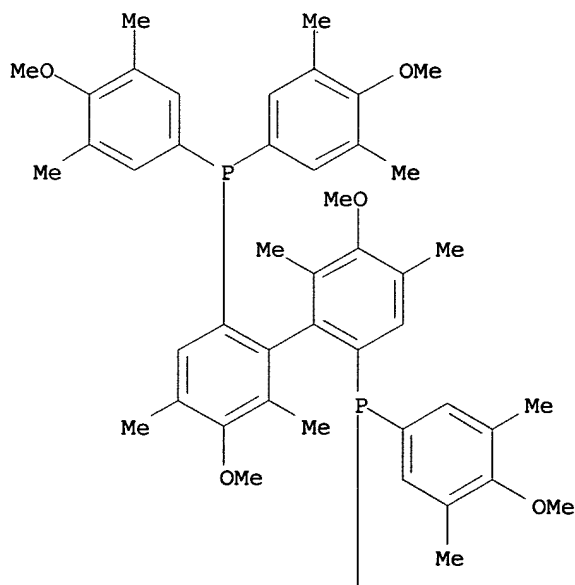


CN Phosphine, [(1R)-4,4',6,6'-tetramethyl[1,1'-biphenyl]-2,2'-diyl]bis[bis(3,5-dimethylphenyl)- (9CI) (CA INDEX NAME)]



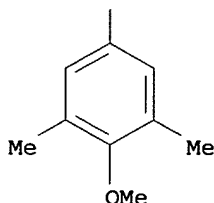
RN 540744-28-3 HCAPLUS

CN Phosphine, [(1S)-5,5'-dimethoxy-4,4',6,6'-tetramethyl[1,1'-biphenyl]-2,2'-diyl]bis[bis(4-methoxy-3,5-dimethylphenyl)- (9CI) (CA INDEX NAME)]



PAGE 1-A

PAGE 2-A



RN 540744-48-7 HCAPLUS  
 CN Palladium(1+), [2-[(1S)-1-(amino-κN)ethyl]phenyl-  
 κC] [[(1S)-5,5'-dimethoxy-4,4',6,6'-tetramethyl[1,1'-biphenyl]-  
 2,2'-diyl]bis[bis(4-methoxy-3,5-dimethylphenyl)phosphine-κP]]-  
 , (SP-4-3)-, tetrafluoroborate(1-) (9CI) (CA INDEX NAME)

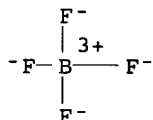
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CRN 540744-47-6  
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 CCI CCS

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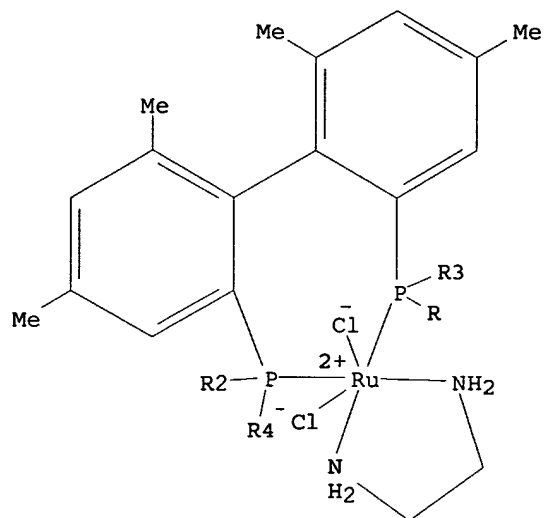
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 CMF B F4  
 CCI CCS

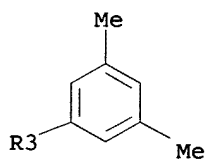
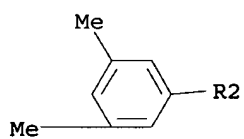
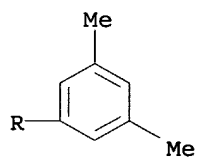


IT 540743-34-8P 540743-35-9P 540743-41-7P  
 540743-42-8P 540744-45-4P 540744-46-5P  
 540744-49-8P  
 RL: CAT (Catalyst use); SPN (Synthetic preparation);  
 PREP (Preparation); USES (Uses)  
 (prepn. of aryl diphosphine chiral  
 ligands and their transition metal  
 complexes for asym. hydrogenation catalysis)  
 RN 540743-34-8 HCAPLUS  
 CN Ruthenium, dichloro(1,2-ethanediamine-κN,κN') [(4,4',6,6'-  
 tetramethyl[1,1'-biphenyl]-2,2'-diyl)bis[bis(3,5-  
 dimethylphenyl)phosphine-κP]]-, (OC-6-13)- (9CI) (CA INDEX  
 NAME)

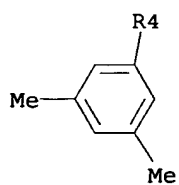
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PAGE 2-A

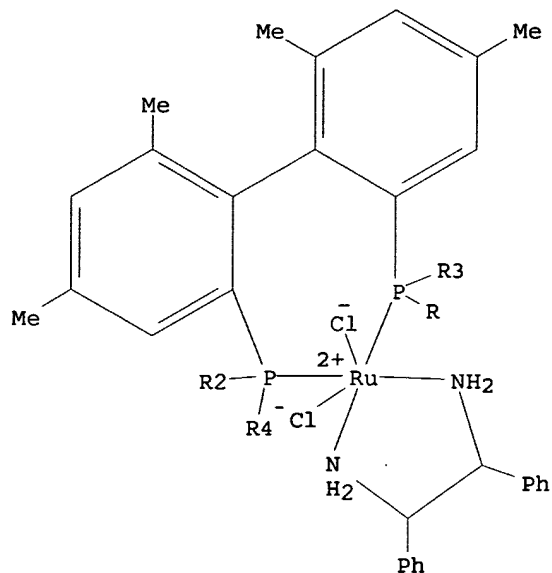


PAGE 3-A

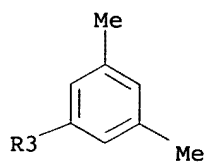
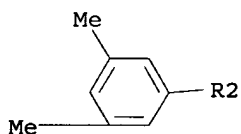
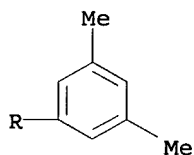


RN 540743-35-9 HCAPLUS  
CN Ruthenium, dichloro[(1S,2S)-1,2-diphenyl-1,2-ethanediamine- $\kappa$ N, $\kappa$ N'][(4,4',6,6'-tetramethyl[1,1'-biphenyl]-2,2'-diyl)bis[bis(3,5-dimethylphenyl)phosphine- $\kappa$ P]]-, (OC-6-13)-(9CI) (CA INDEX NAME)

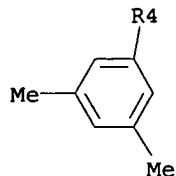
PAGE 1-A



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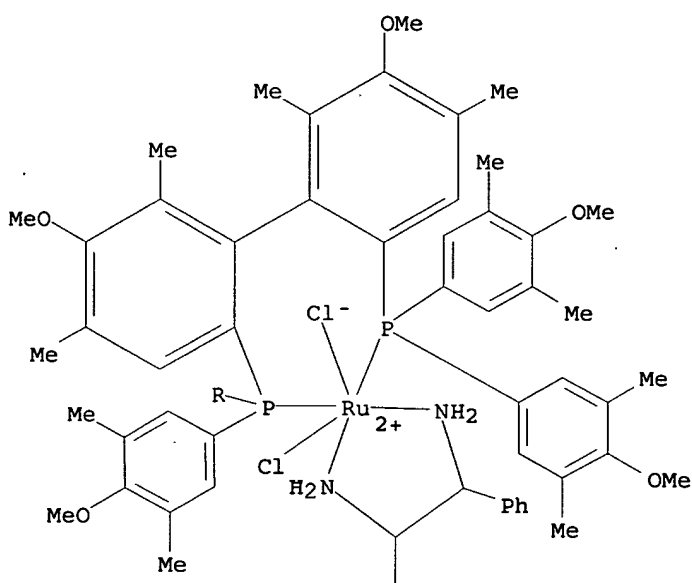


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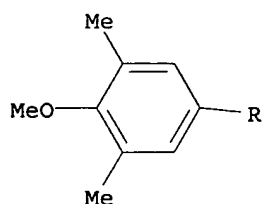


RN 540743-41-7 HCAPLUS  
 CN Ruthenium, dichloro[[[(1S)-5,5'-dimethoxy-4,4',6,6'-tetramethyl[1,1'-biphenyl]-2,2'-diyl]bis[bis(4-methoxy-3,5-dimethylphenyl)phosphine-κP]][(1S,2S)-1,2-diphenyl-1,2-ethanediamine-κN,κN']]-, (OC-6-13)- (9CI) (CA INDEX NAME)

PAGE 1-A

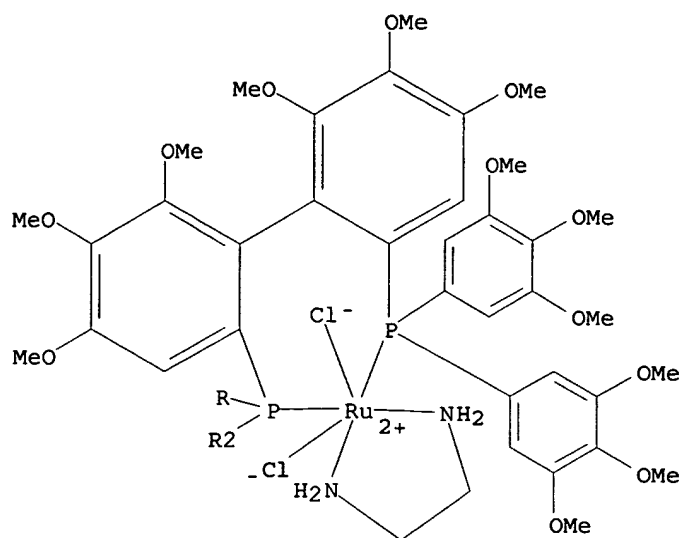


PAGE 2-A

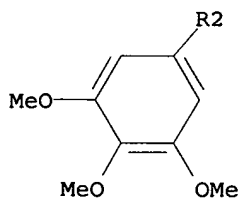
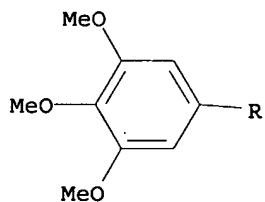


RN 540743-42-8 HCAPLUS  
 CN Ruthenium, dichloro(1,2-ethanediamine-κN,κN')[(4,4',5,5',6,6'-hexamethoxy[1,1'-biphenyl]-2,2'-diyl)bis[bis(3,4,5-trimethoxyphenyl)phosphine-κP]]-, (OC-6-13)- (9CI) (CA INDEX NAME)

PAGE 1-A

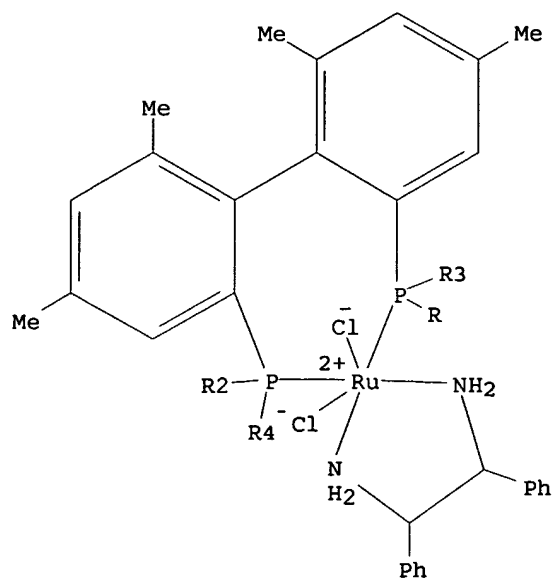


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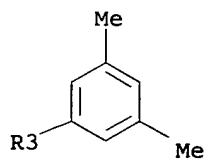
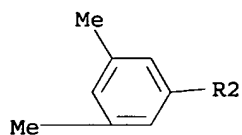
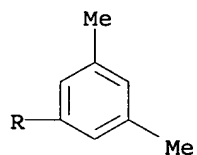


RN 540744-45-4 HCAPLUS  
 CN Ruthenium, dichloro[(1R,2R)-1,2-diphenyl-1,2-ethanediamine- $\kappa$ N, $\kappa$ N'][[[(1R)-4,4',6,6'-tetramethyl[1,1'-biphenyl]-2,2'-diyl]bis[bis(3,5-dimethylphenyl)phosphine- $\kappa$ P]]-, (OC-6-13)-(9CI) (CA INDEX NAME)

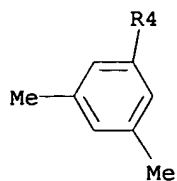
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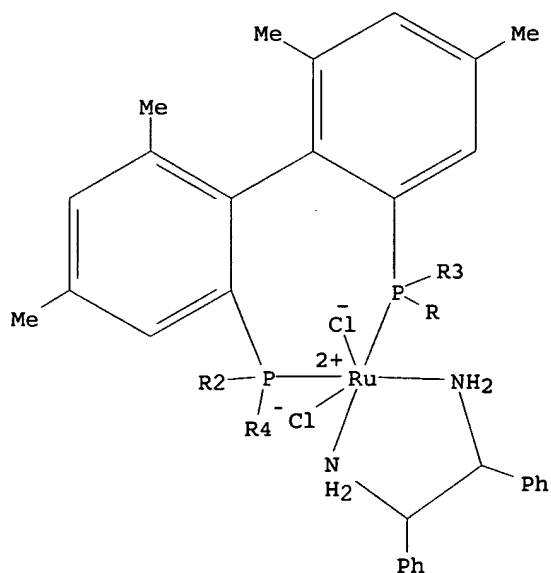


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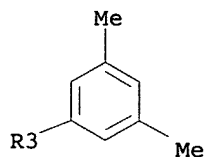
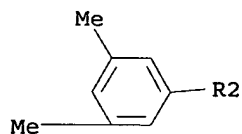
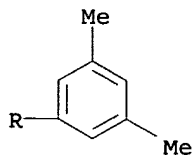
RN 540744-46-5 HCAPLUS  
CN Ruthenium, dichloro[(1S,2S)-1,2-diphenyl-1,2-ethanediamine- $\kappa$ N, $\kappa$ N'] [[[(1R)-4,4',6,6'-tetramethyl[1,1'-biphenyl]-2,2'-diyl]bis[bis(3,5-dimethylphenyl)phosphine- $\kappa$ P]]-, (OC-6-13)-(9CI) (CA INDEX NAME)

PAGE 1-A

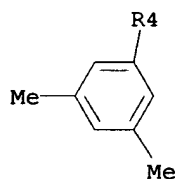




PAGE 2-A

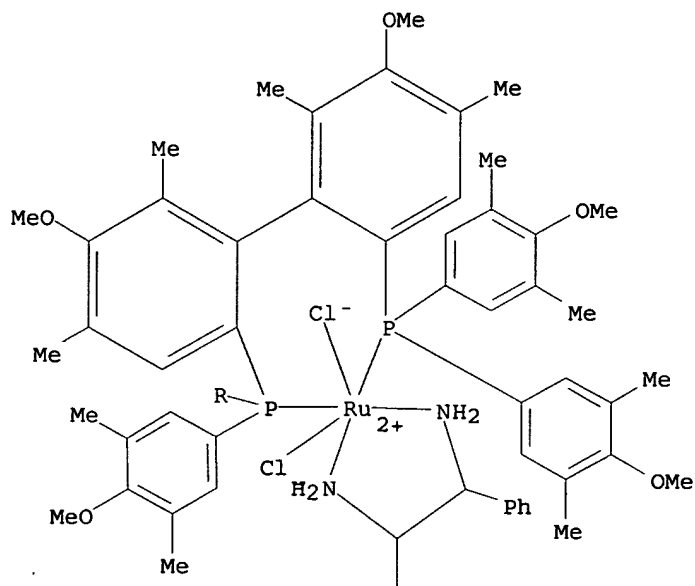


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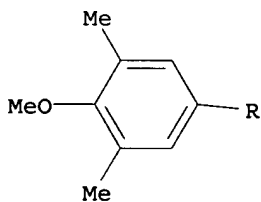


RN 540744-49-8 HCAPLUS  
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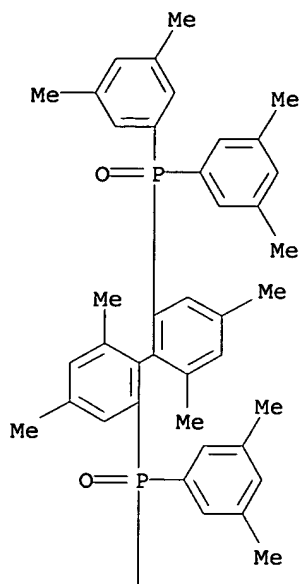


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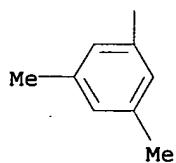


IT 540743-30-4P 540743-37-1P 540743-38-2P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP  
 (Preparation); RACT (Reactant or reagent)  
 (prepn. of aryl diphosphine chiral  
 ligands and their transition metal  
 complexes for asym. hydrogenation catalysis)  
 RN 540743-30-4 HCAPLUS  
 CN Phosphine oxide, (4,4',6,6'-tetramethyl[1,1'-biphenyl]-2,2'-  
 diyl)bis[bis(3,5-dimethylphenyl)- (9CI) (CA INDEX NAME)

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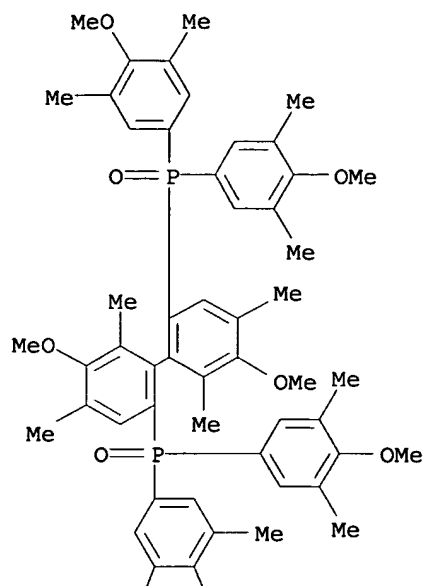


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RN 540743-37-1 HCAPLUS  
CN Phosphine oxide, (5,5'-dimethoxy-4,4',6,6'-tetramethyl[1,1'-  
biphenyl]-2,2'-diyl)bis[bis(4-methoxy-3,5-dimethylphenyl)- (9CI)  
(CA INDEX NAME)

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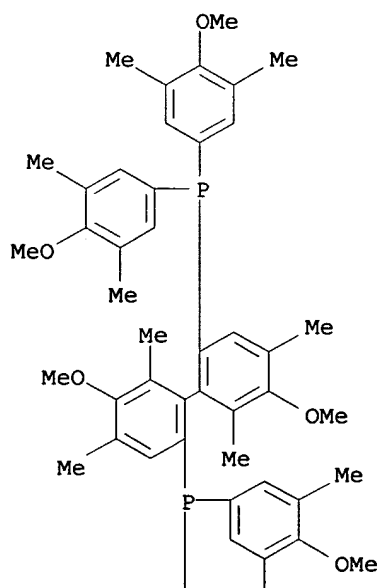


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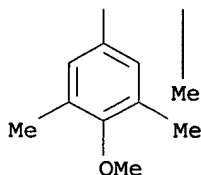


RN 540743-38-2 HCAPLUS  
 CN Phosphine, (5,5'-dimethoxy-4,4',6,6'-tetramethyl[1,1'-biphenyl]-2,2'-diyl)bis[bis(4-methoxy-3,5-dimethylphenyl)- (9CI) (CA INDEX NAME)

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- IC ICM C07F009-50  
ICS B01J031-24
- CC 29-7 (Organometallic and Organometalloidal Compounds)  
Section cross-reference(s): 25
- IT **Ligands**  
RL: CAT (Catalyst use); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)  
(chiral, diphosphine; prepn. of aryl diphosphine chiral ligands and their transition metal complexes for asym. hydrogenation catalysis)
- IT Hydrogenation catalysts  
(stereoselective; prepn. of aryl diphosphine chiral ligands and their transition metal complexes for asym. hydrogenation catalysis)
- IT 540744-40-9P 540744-43-2P  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(decomplexation; prepn. of aryl diphosphine chiral ligands and their transition metal complexes for asym. hydrogenation catalysis)
- IT 540743-33-7P  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(optical resolu.; prepn. of aryl diphosphine chiral ligands and their transition metal complexes for asym. hydrogenation catalysis)
- IT 37366-09-9 52462-29-0  
RL: CAT (Catalyst use); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)  
(prepn. of aryl diphosphine chiral ligands and their transition metal complexes for asym. hydrogenation catalysis)
- IT 540743-31-5P 540743-40-6P 540744-26-1P 540744-27-2P 540744-28-3P 540744-48-7P  
RL: CAT (Catalyst use); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)  
(prepn. of aryl diphosphine chiral ligands and their transition metal complexes for asym. hydrogenation catalysis)
- IT 540743-34-8P 540743-35-9P 540743-41-7P 540743-42-8P 540744-45-4P 540744-46-5P 540744-49-8P  
RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
(prepn. of aryl diphosphine chiral ligands and their transition metal complexes for asym. hydrogenation catalysis)
- IT 98-86-2, Acetophenone, reactions 107-15-3, Ethylenediamine, reactions 131-58-8, 2-Methylbenzophenone 556-96-7,

1-Bromo-3,5-dimethylbenzene 1122-62-9, 2-Acetylpyridine  
 14804-38-7, 1-Bromo-2,3-dimethyl-4-methoxybenzene 29841-69-8,  
 (S,S)-1,2-Diphenylethane-1,2-diamine 35132-20-8,  
 (R,R)-1,2-Diphenylethane-1,2-diamine 193158-80-4 540744-29-4  
 RL: RCT (Reactant); RACT (Reactant or reagent)

(prepn. of aryl diphosphine chiral  
 ligands and their transition metal  
 complexes for asym. hydrogenation catalysis)

IT 381212-20-OP 540743-29-1P 540743-30-4P 540743-36-OP  
 540743-37-1P 540743-38-2P 540743-43-9P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP  
 (Preparation); RACT (Reactant or reagent)

(prepn. of aryl diphosphine chiral  
 ligands and their transition metal  
 complexes for asym. hydrogenation catalysis)

IT 68986-76-5

RL: RGT (Reagent); RACT (Reactant or reagent)

(prepn. of aryl diphosphine chiral  
 ligands and their transition metal  
 complexes for asym. hydrogenation catalysis)

IT 1445-91-6P 1517-69-7P 5472-13-9P 18728-61-5P

RL: SPN (Synthetic preparation); PREP (Preparation)

(prepn. of aryl diphosphine chiral  
 ligands and their transition metal  
 complexes for asym. hydrogenation catalysis)

REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR  
 THIS RECORD. ALL CITATIONS AVAILABLE IN  
 THE RE FORMAT

L26 ANSWER 23 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2003:411128 HCAPLUS

DOCUMENT NUMBER: 139:133663

TITLE: Planar chirality in tethered  
 $\eta^6$ : $\eta^1$ -(phosphinophenylenearene-  
 P)ruthenium(II) complexes and their potential  
 use as asymmetric catalysts

AUTHOR(S): Faller, J. W.; D'Alliessi, Darlene G.

CORPORATE SOURCE: Department of Chemistry, Yale University, New  
 Haven, CT, 06520, USA

SOURCE: Organometallics (2003), 22(13),  
 2749-2757

CODEN: ORGND7; ISSN: 0276-7333

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

OTHER SOURCE(S): CASREACT 139:133663

AB Stereochem. and asym. catalytic activity of ruthenium monocationic  
 and dicationic  $\eta^6$ -arene complexes with tethered  
 dicyclohexylphosphino complexing group was studied. Treatment of  
 [ $(\eta^6$ -benzene)RuCl<sub>2</sub>]<sub>2</sub> with 2-dicyclohexylphosphino-2'-(N,N-  
 dimethylamino)biphenyl (LA) yielded the planar chiral, tethered  
 complex [Ru( $\eta^6$ : $\eta^1$ -2-(dicyclohexylphosphino- $\kappa$ P)-2'-(N,N-  
 dimethylamino)-1,1'-biphenyl)Cl<sub>2</sub>] (2, [Ru( $\eta^6$ : $\eta^1$ -LA-P)Cl<sub>2</sub>]).  
 Abstraction of a chloride from 2 with AgSbF<sub>6</sub> and treatment with PPh<sub>3</sub>  
 gave the chiral-at-metal complex anti-[Ru( $\eta^6$ : $\eta^1$ -LA-  
 P)(PPh<sub>3</sub>)Cl]SbF<sub>6</sub>, 3a, which underwent spontaneous resoln. upon  
 crystn. The Me<sub>2</sub>N group is coplanar with the  $\eta^6$ -Ph ring in the  
 cations and directs attack at the metal center, as well as detg. the  
 thermodyn. stability of anti vs. syn epimers. The dication derived  
 from enantiopure 3a catalyzed the Diels-Alder reaction of  
 methacrolein and cyclopentadiene with modest (19-23%)  
 enantioselectivity and good exo/endo ratio (96%). Analogs of 2 and  
 3a contg. 2-(dicyclohexylphosphino)-2'-methyl-1,1'-biphenyl were  
 also prepd. The configuration at the metal center is stable at the  
 conditions studied. Averaged NMR spectra at ambient temps. are  
 obsd., however, due to rapid conformational interconversions that

can be slowed at low temp.

IT 569346-92-5P

RL: CAT (Catalyst use); PUR (Purification or recovery);

SPN (Synthetic preparation); PREP (Preparation); USES

(Uses)

(spontaneous resolu., Diels-Alder catalyst; **prepn.**,  
resolu., structure and asym. catalytic activity of ruthenium  
planar-chiral  $\eta^6$ -arene complexes with tethered  
phosphine ligands)

RN 569346-92-5 HCAPLUS

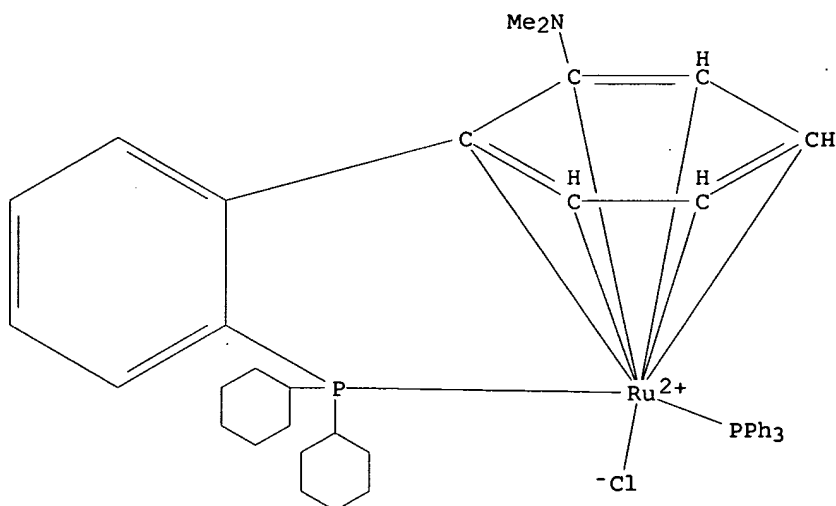
CN Ruthenium(1+), chloro[(1,2,3,4,5,6- $\eta$ )-2'-(dicyclohexylphosphino-  
 $\kappa$ P)-N,N-dimethyl[1,1'-biphenyl]-2-amine](triphenylphosphine)-,  
stereoisomer, (OC-6-11)-hexafluoroantimonate(1-) (9CI) (CA INDEX  
NAME)

CM 1

CRN 569346-91-4

CMF C44 H51 Cl N P2 Ru

CCI CCS

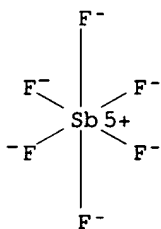


CM 2

CRN 17111-95-4

CMF F6 Sb

CCI CCS



IT 569346-90-3P

RL: CAT (Catalyst use); PRP (Properties); PUR

(Purification or recovery); SPN (Synthetic preparation); **PREP**

**(Preparation); USES (Uses)**

(spontaneous resolu., crystal structure, Diels-Alder catalyst;  
**prepn.**, resolu., structure and asym. catalytic activity  
 of ruthenium planar-chiral  $\eta^6$ -arene complexes with tethered  
 phosphine ligands)

RN 569346-90-3 HCAPLUS

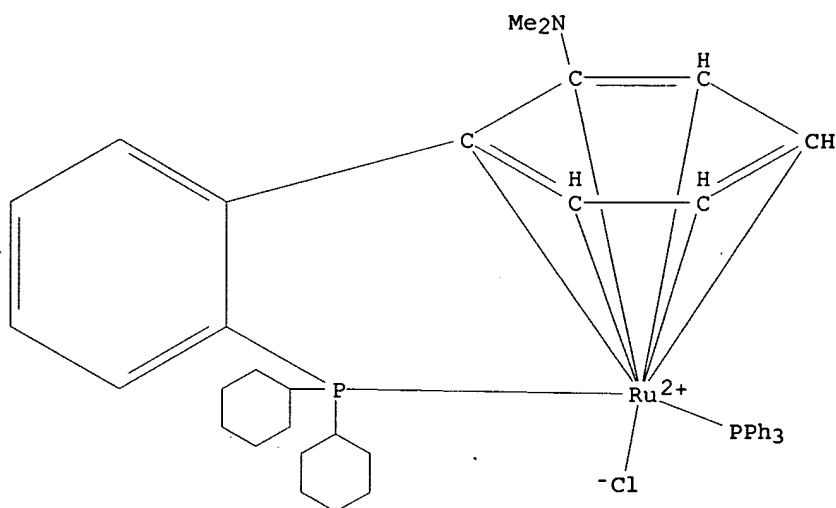
CN Ruthenium(1+), chloro[(1,2,3,4,5,6- $\eta$ )-2'-(dicyclohexylphosphino-  
 $\kappa$ P)-N,N-dimethyl[1,1'-biphenyl]-2-amine](triphenylphosphine)-,  
 stereoisomer, (OC-6-11)-hexafluoroantimonate(1-) (9CI) (CA INDEX  
 NAME)

CM 1

CRN 569346-89-0

CMF C44 H51 Cl N P2 Ru

CCI CCS

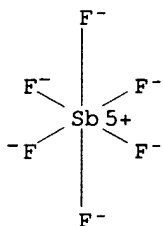


CM 2

CRN 17111-95-4

CMF F6 Sb

CCI CCS



CC 29-13 (Organometallic and Organometalloidal  
 Compounds)

Section cross-reference(s): 22, 75

IT 569346-92-5P

RL: CAT (Catalyst use); PUR (Purification or recovery);  
 SPN (Synthetic preparation); PREP (Preparation); USES  
 (Uses)



(spontaneous resoln., Diels-Alder catalyst; **prepn.**,  
resoln., structure and asym. catalytic activity of ruthenium  
planar-chiral  $\eta^6$ -arene complexes with tethered  
phosphine ligands)

IT 569346-90-3P

RL: CAT (Catalyst use); PRP (Properties); PUR  
(Purification or recovery); SPN (Synthetic preparation); **PREP**  
(Preparation); USES (Uses)

(spontaneous resoln., crystal structure, Diels-Alder catalyst;  
**prepn.**, resoln., structure and asym. catalytic activity  
of ruthenium planar-chiral  $\eta^6$ -arene complexes with tethered  
phosphine ligands)

REFERENCE COUNT: 47 THERE ARE 47 CITED REFERENCES AVAILABLE  
FOR THIS RECORD. ALL CITATIONS AVAILABLE  
IN THE RE FORMAT

L26 ANSWER 24 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2003:363792 HCAPLUS

DOCUMENT NUMBER: 139:245721

TITLE: A concise synthesis of a new xylyl-biaryl  
diphosphine ligand for asymmetric hydrogenation  
of ketones

AUTHOR(S): Henschke, Julian P.; Zanotti-Gerosa, Antonio;  
Moran, Paul; Harrison, Paul; Mullen, Brendan;  
Casy, Guy; Lennon, Ian C.

CORPORATE SOURCE: A Subsidiary of The Dow Chemical Company, Unit  
321, Chirotech Technology Ltd., Cambridge, CB4  
0WG, UK

SOURCE: Tetrahedron Letters (2003), 44(23),  
4379-4383

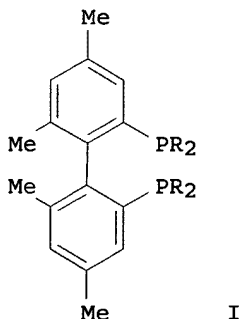
CODEN: TELEAY; ISSN: 0040-4039  
PUBLISHER: Elsevier Science Ltd.

DOCUMENT TYPE: Journal

LANGUAGE: English

OTHER SOURCE(S): CASREACT 139:245721

GI



AB A concise synthesis of a sym. biaryl diphosphine ligand bearing  
3,5-dimethylphenyl substituents at phosphorus is described. The  
ruthenium catalysts [diphosphine RuCl<sub>2</sub> diamine] contg. the new  
ligand (R)- or (S)-I [R = 3,5-Me<sub>2</sub>C<sub>6</sub>H<sub>3</sub>] were found to be as active  
and as selective as the state-of-the-art catalysts for homogeneous  
asym. ketone hydrogenation.

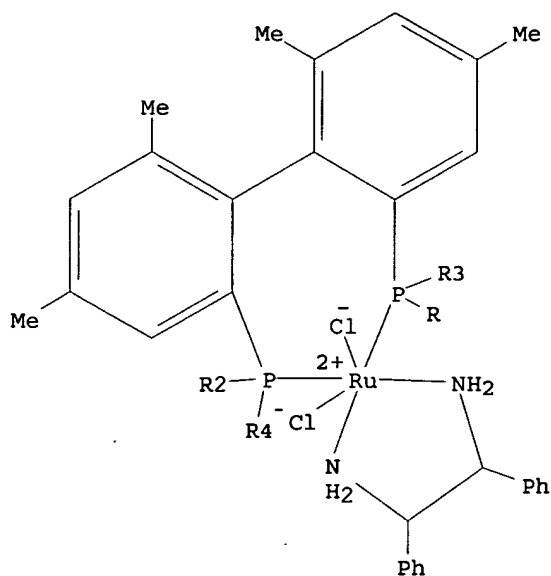
IT 540744-45-4P 540744-46-5P 600127-09-1P  
600135-73-7P

RL: CAT (Catalyst use); SPN (Synthetic preparation);  
**PREP** (Preparation); USES (Uses)

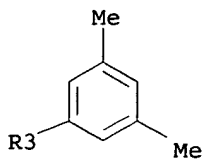
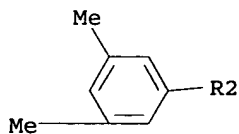
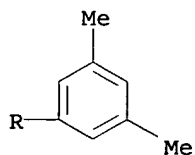
(prepn. of a xylyl biaryl diphosphine  
ligand for asym. hydrogenation of ketones)

RN 540744-45-4 HCAPLUS  
CN Ruthenium, dichloro[(1R,2R)-1,2-diphenyl-1,2-ethanediamine- $\kappa$ N, $\kappa$ N'][[[(1R)-4,4',6,6'-tetramethyl[1,1'-biphenyl]-2,2'-diyl]bis[bis(3,5-dimethylphenyl)phosphine- $\kappa$ P]]-, (OC-6-13)-(9CI) (CA INDEX NAME)

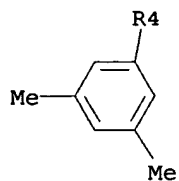
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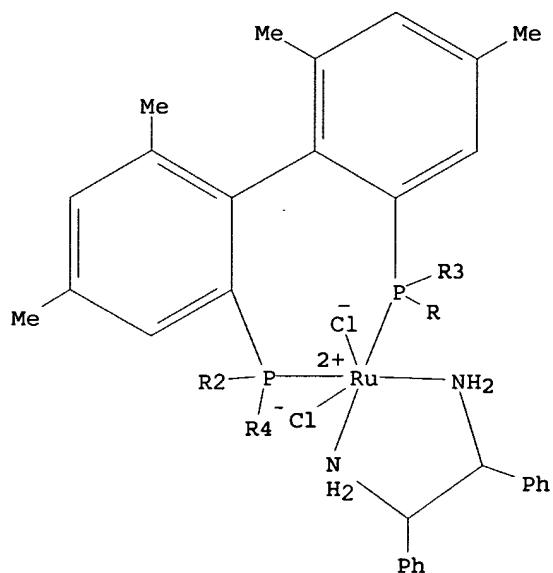


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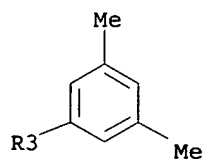
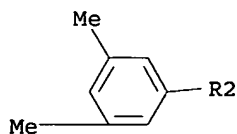
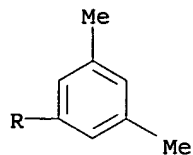


RN 540744-46-5 HCAPLUS  
 CN Ruthenium, dichloro[(1S,2S)-1,2-diphenyl-1,2-ethanediamine- $\kappa$ N, $\kappa$ N'][[[(1R)-4,4',6,6'-tetramethyl[1,1'-biphenyl]-2,2'-diyl]bis[bis(3,5-dimethylphenyl)phosphine- $\kappa$ P]]-, (OC-6-13)-(9CI) (CA INDEX NAME)

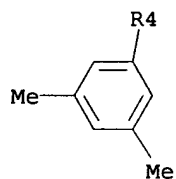
PAGE 1-A



PAGE 2-A



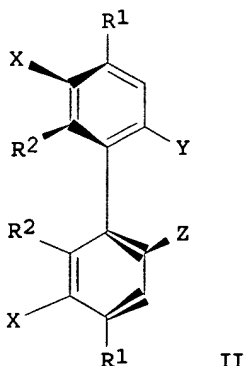
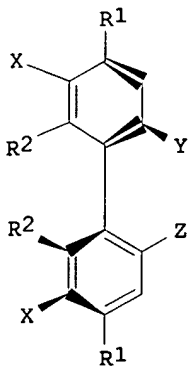
PAGE 3-A



RN 600127-09-1 HCAPLUS  
 CN Ruthenium, [(2R)-1,1-bis(4-methoxyphenyl)-3-methyl-1,2-butanediamine- $\kappa$ N, $\kappa$ N']dichloro[[[(1R)-4,4',6,6'-tetramethyl[1,1'-biphenyl]-2,2'-diyl]bis[bis(3,5-dimethylphenyl)phosphine- $\kappa$ P]]-  
 , (OC-6-14)- (9CI) (CA INDEX NAME)

bis(diphenylphosphino)biphenyls, transition  
 metal complexes having them as ligands, and  
 optically active compounds using the complexes  
 as hydrogenation catalysts  
 INVENTOR(S): Yokosawa, Susumu; Sayou, Noboru; Matsumura,  
 Kazuhiko; Unrin, Hidenori  
 PATENT ASSIGNEE(S): Takasago Perfumery Co., Ltd., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 12 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 10067789	A2	19980310	JP 1996-261112	199608 27
JP 3493266	B2	20040203	<--	
US 5847222	A	19981208	US 1997-918347	199708 26
EP 826691	A2	19980304	EP 1997-402005	199708 27
EP 826691	A3	19990210	<--	
EP 826691	B1	20020710		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
PRIORITY APPLN. INFO.:			JP 1996-261112	A 199608 27
<--				
OTHER SOURCE(S):	CASREACT 128:270732; MARPAT 128:270732			
GI				



AB Diphosphines I or II (Y = Z = PPh<sub>2</sub>; X = Cl, Br; R<sub>1</sub>, R<sub>2</sub> =  
 Cl-3 alkyl) are prepd. by reaction of  
 bis(trifluoromethanesulfonyloxy)biphenyls I or II (Y = Z = OSO<sub>2</sub>CF<sub>3</sub>;  
 X, R<sub>1</sub>, R<sub>2</sub> = same as above) with Ph<sub>2</sub>P(O)H, redn. of  
 (phenylphosphinyl)biphenyls I or II (Y = P(O)Ph<sub>2</sub>; Z = OSO<sub>2</sub>CF<sub>3</sub>; X,

R1, R2 = same as above), reaction of (phenylphosphino)biphenyls I or II (Y = PPh<sub>2</sub>; Z = OSO<sub>2</sub>CF<sub>3</sub>; X, R1, R2 = same as above) with Ph<sub>2</sub>P(O)H, and redn. of bis(phenylphosphinyl)biphenyls I or II (Y = Z = P(O)Ph<sub>2</sub>; X, R1, R2 = same as above). Optically active compds. are **prepd.** by asym. hydrogenation of HOCH<sub>2</sub>COMe in the presence of the **transition metal** complexes having I or II

(Y = Z = PPh<sub>2</sub>; X, R1, R2 = same as above) as **ligands**.

Thus, (R)-(+)-2,2'-bis(diphenylphosphinyl)-5,5'-dichloro-4,4',6,6'-tetramethyl-1,1'-biphenyl [**prepd.** from

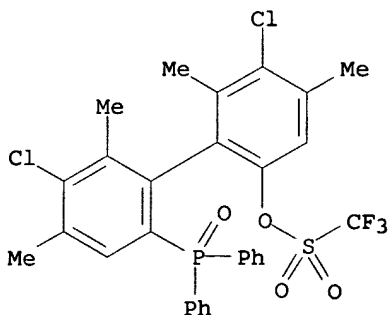
(R)-(-)-2,2'-bis(trifluoromethanesulfonyloxy)-5,5'-dichloro-4,4',6,6'-tetramethyl-1,1'-biphenyl via several steps] was reduced with HSiCl<sub>3</sub> and PhNMe<sub>2</sub> in PhMe under reflux for 12 h to give 81%

(R)-(+)-2,2'-bis(diphenylphosphino)-5,5'-dichloro-4,4',6,6'-tetramethyl-1,1'-biphenyl [(R)-(+)-CM-BIPHEMP]. Reaction of [Ru(cod)Cl<sub>2</sub>]<sub>n</sub> with (R)-(+)-CM-BIPHEMP and Et<sub>3</sub>N in PhMe under reflux for 18 h gave [Ru<sub>2</sub>Cl<sub>4</sub>[(R)-(+)-CM-BIPHEMP]<sub>2</sub>NEt<sub>3</sub>], which was then used as a catalyst for asym. hydrogenation of HOCH<sub>2</sub>COMe in MeOH at 65° under 10 atm of H<sub>2</sub> for 16 h to 97.8% (R)-HOCH<sub>2</sub>CHMeOH. .

IT 205375-80-0P, (R)-(+)-2-Diphenylphosphinyl-2'-(trifluoromethanesulfonyloxy)-5,5'-dichloro-4,4',6,6'-tetramethyl-1,1'-biphenyl 205375-81-1P, (R)-(+)-2-Diphenylphosphino-2'-(trifluoromethanesulfonyloxy)-5,5'-dichloro-4,4',6,6'-tetramethyl-1,1'-biphenyl 205375-82-2P, (R)-(+)-2,2'-Bis(diphenylphosphinyl)-5,5'-dichloro-4,4',6,6'-tetramethyl-1,1'-biphenyl 205443-95-4P, (R)-(+)-CM-BIPHEMP  
RL: RCT (Reactant); SPN (Synthetic preparation); **PREP** (**Preparation**); RACT (Reactant or reagent)  
(prepn. of optically active bis(diphenylphosphino)biphenyls)

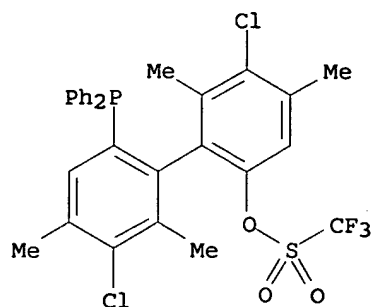
RN 205375-80-0 HCAPLUS

CN Methanesulfonic acid, trifluoro-, 3',5-dichloro-6'-(diphenylphosphinyl)-2',4,4',6-tetramethyl[1,1'-biphenyl]-2-yl ester, (R)- (9CI) (CA INDEX NAME)



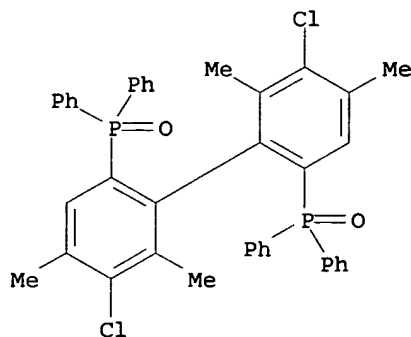
RN 205375-81-1 HCAPLUS

CN Methanesulfonic acid, trifluoro-, 3',5-dichloro-6'-(diphenylphosphino)-2',4,4',6-tetramethyl[1,1'-biphenyl]-2-yl ester, (R)- (9CI) (CA INDEX NAME)



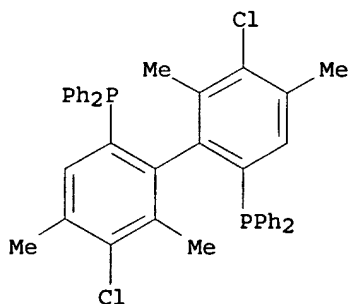
RN 205375-82-2 HCAPLUS

CN Phosphine oxide, (5,5'-dichloro-4,4',6,6'-tetramethyl[1,1'-biphenyl]-2,2'-diyl)bis[diphenyl-, (R)- (9CI) (CA INDEX NAME)



RN 205443-95-4 HCAPLUS

CN Phosphine, (5,5'-dichloro-4,4',6,6'-tetramethyl[1,1'-biphenyl]-2,2'-diyl)bis[diphenyl-, (R)- (9CI) (CA INDEX NAME)



IT 205247-98-9P 205247-99-0P 205248-00-6P

RL: CAT (Catalyst use); SPN (Synthetic preparation);

PREP (Preparation); USES (Uses)

(prepn. of transition metal complexes from Ru compds. and bis(diphenylphosphino)biphenyls)

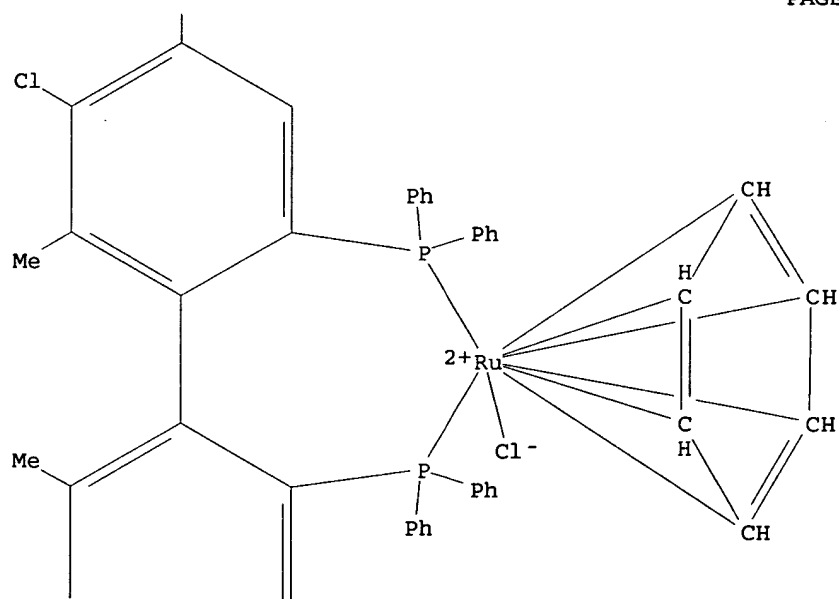
RN 205247-98-9 HCAPLUS

CN Ruthenium(1+), (η6-benzene)chloro[(5,5'-dichloro-4,4',6,6'-tetramethyl[1,1'-biphenyl]-2,2'-diyl)bis[diphenylphosphine-κP]]-, chloride, (R)- (9CI) (CA INDEX NAME)

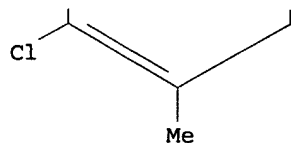
PAGE 1-A

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PAGE 2-A







PAGE 3-A

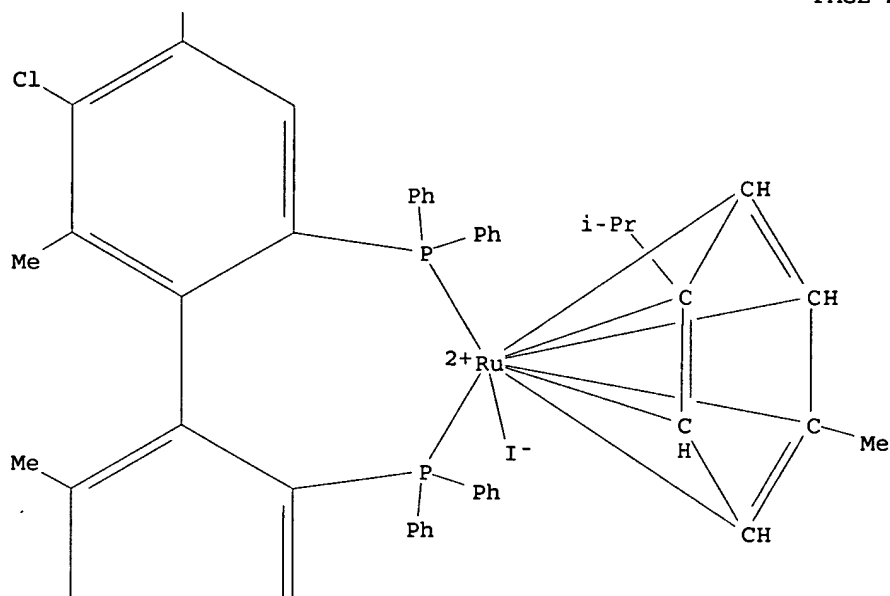


RN 205247-99-0 HCAPLUS  
CN Ruthenium(1+), [(5,5'-dichloro-4,4',6,6'-tetramethyl[1,1'-biphenyl]-  
2,2'-diyl)bis[diphenylphosphine-κP]]iodo[(1,2,3,4,5,6-η)-1-  
methyl-4-(1-methylethyl)benzene]-, iodide, (R)- (9CI) (CA INDEX  
NAME)

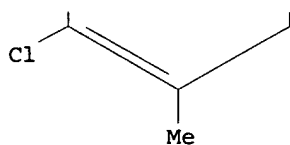
PAGE 1-A

Me

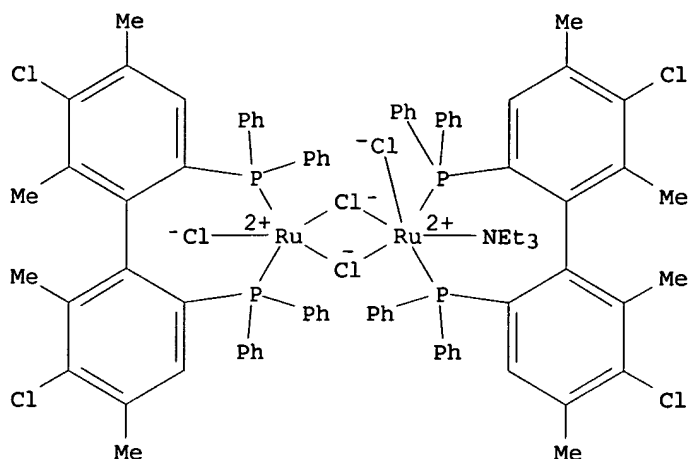
PAGE 2-A



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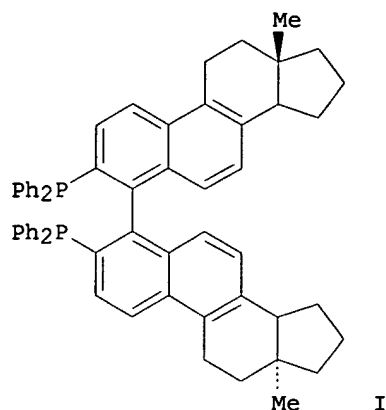


RN 205248-00-6 HCAPLUS  
 CN Ruthenium, di- $\mu$ -chlorodichlorobis[(5,5'-dichloro-4,4',6,6'-tetramethyl[1,1'-biphenyl]-2,2'-diyl)bis[diphenylphosphine- $\kappa$ P]](N,N-diethylethanamine)di-, stereoisomer (9CI) (CA INDEX NAME)



IC ICM C07F009-50  
ICS B01J031-22; C07B053-00; C07B061-00; C07M007-00  
CC 29-7 (Organometallic and Organometalloidal Compounds)  
Section cross-reference(s): 23, 67  
IT 7439-88-5, Iridium, uses 7440-02-0, Nickel, uses 7440-05-3,  
Palladium, uses 7440-16-6, Rhodium, uses  
RL: CAT (Catalyst use); USES (Uses)  
(prepn. of alcs. by asym. hydrogenation of ketones using  
Ru-bis(diphenylphosphino)biphenyl complex catalysts)  
IT 205375-79-7P, (R)-(-)-2,2'-Bis(trifluoromethanesulfonyloxy)-5,5'-  
dichloro-4,4',6,6'-tetramethyl-1,1'-biphenyl 205375-80-0P,  
(R)-(+)-2-Diphenylphosphinyl-2'-trifluoromethanesulfonyloxy-5,5'-  
dichloro-4,4',6,6'-tetramethyl-1,1'-biphenyl 205375-81-1P,  
(R)-(+)-2-Diphenylphosphino-2'-(trifluoromethanesulfonyloxy)-5,5'-  
dichloro-4,4',6,6'-tetramethyl-1,1'-biphenyl 205375-82-2P,  
(R)-(+)-2,2'-Bis(diphenylphosphinyl)-5,5'-dichloro-4,4',6,6'-  
tetramethyl-1,1'-biphenyl 205375-83-3P 205443-95-4P,  
(R)-(+)-CM-BIPHEMP  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP  
(Preparation); RACT (Reactant or reagent)  
(prepn. of optically active bis(diphenylphosphino)biphenyls)  
IT 205247-98-9P 205247-99-0P 205248-00-6P  
RL: CAT (Catalyst use); SPN (Synthetic preparation);  
PREP (Preparation); USES (Uses)  
(prepn. of transition metal complexes from Ru compds. and  
bis(diphenylphosphino)biphenyls)

L26 ANSWER 52 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 1997:684670 HCAPLUS  
DOCUMENT NUMBER: 127:330924  
TITLE: A Bis-Steroidal Phosphine as New Chiral  
Hydrogenation Ligand  
AUTHOR(S): Enev, V.; Ewers, Ch. L. J.; Harre, M.; Nickisch,  
K.; Mohr, J. T.  
CORPORATE SOURCE: Process Research, Schering AG-Berlin, Berlin,  
D-13342, Germany  
SOURCE: Journal of Organic Chemistry (1997),  
62(21), 7092-7093  
CODEN: JOCEAH; ISSN: 0022-3263  
PUBLISHER: American Chemical Society  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
OTHER SOURCE(S): CASREACT 127:330924  
GI



AB The new atropisomeric bissteroidal ligands R- and S-I are synthesized in 4 steps from the steroid precursor equilenin. The diastereomeric ligands are separable by column chromatog. and exhibit mirror image CD spectra. Likewise, they induce in the chiral redn. of acetophenone to enantiomeric 1-phenylethanols. The synthesis of the phosphine ligands R- and S-I is accomplished by a Ni-mediated cross coupling of the corresponding triflates with Ph<sub>2</sub>PH. The application of this new bissteroidal phosphine in the hydrogenation of Me acetoacetate, phenylcinnamic acid, and tiglic acid show that the in situ prepd. chiral catalyst RuCl<sub>2</sub>(ligand)(DMF)<sub>2</sub> is more active in terms of enantiomeric excess and/or conversion than the corresponding BINAP-derived catalyst.

IT 197705-71-8P 197808-25-6P

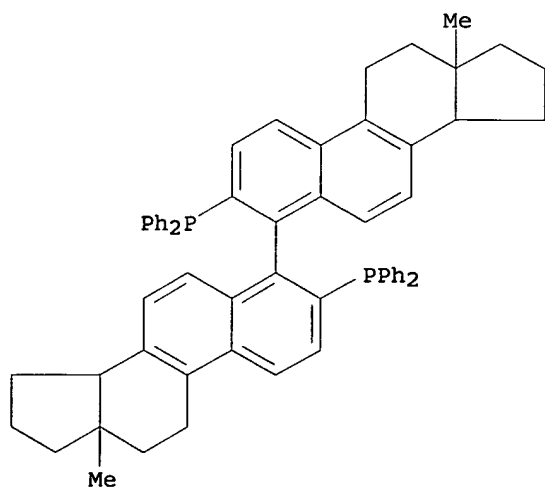
RL: CAT (Catalyst use); SPN (Synthetic preparation);

PREP (Preparation); USES (Uses)

(prepn. of bissteroidal phosphine as new  
chiral hydrogenation ligand)

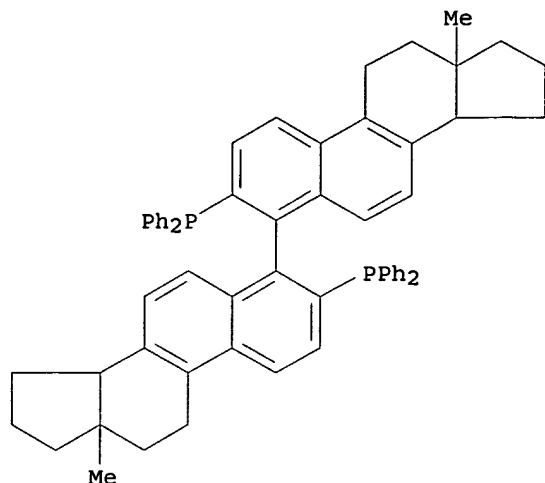
RN 197705-71-8 HCAPLUS

CN Phosphine, (4R)-[4,4'-biestra-1,3,5,7,9-pentaene]-3,3'-  
diylbis[diphenyl- (9CI) (CA INDEX NAME)



RN 197808-25-6 HCAPLUS

CN Phosphine, (4S)-[4,4'-biestra-1,3,5,7,9-pentaene]-3,3'-  
diylbis[diphenyl- (9CI) (CA INDEX NAME)



CC 21-2 (General Organic Chemistry)  
Section cross-reference(s): 32, 67

IT 197705-71-8P 197808-25-6P  
RL: CAT (Catalyst use); SPN (Synthetic preparation);  
PREP (Preparation); USES (Uses)  
(prepn. of bissteroidal phosphine as new  
chiral hydrogenation ligand)

REFERENCE COUNT: 18 THERE ARE 18 CITED REFERENCES AVAILABLE  
FOR THIS RECORD. ALL CITATIONS AVAILABLE  
IN THE RE FORMAT

L26 ANSWER 53 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1997:602685 HCAPLUS

DOCUMENT NUMBER: 127:293410

TITLE: Tertiary phosphines, their transition metal  
complexes, and regioselective and  
stereoselective preparation of optically active  
organosilicon compounds using the complexes as  
catalysts

INVENTOR(S): Hayashi, Tamio; Uozumi, Yasuhiro

PATENT ASSIGNEE(S): Sumitomo Chemical Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

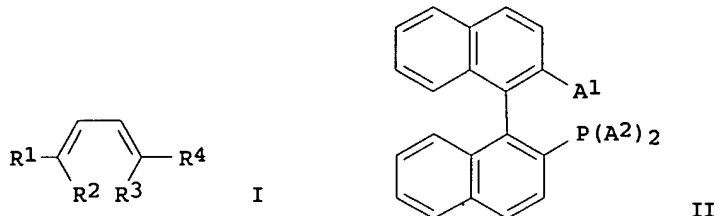
LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

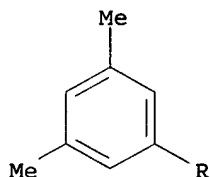
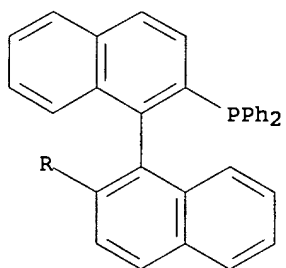
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 09235289	A2	19970909	JP 1996-44679	199603 01
JP 3430775	B2	20030728	JP 1996-44679	199603 01

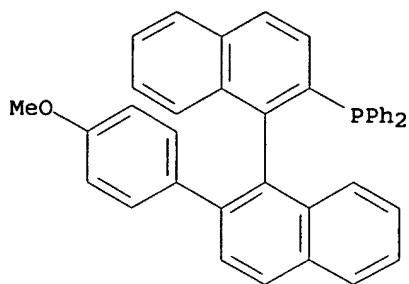
OTHER SOURCE(S): CASREACT 127:293410; MARPAT 127:293410  
GI



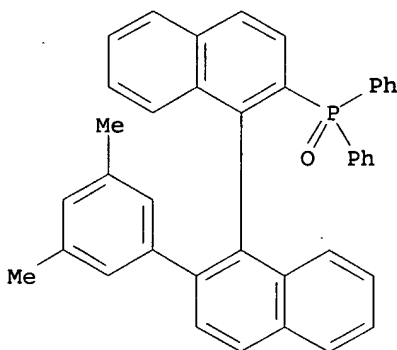
- AB Optically active (Z)-((XYZSi)CR<sub>1</sub>R<sub>2</sub>)CH:CH(CHR<sub>3</sub>R<sub>4</sub>) [R<sub>1</sub>-R<sub>4</sub> = H, linear or branched (un)substituted alkyl, (un)substituted cycloalkyl, (un)substituted Ph; R<sub>2</sub>R<sub>3</sub> may form (CH<sub>2</sub>)<sub>n</sub>; n = 1-3; X, Y, Z = H, alkyl, alkoxy, halo] are prep'd. by reaction of dienes I (R<sub>1</sub>-R<sub>4</sub> = same as above) with HSiXYZ (X, Y, Z = same as above) in the presence of transition metal complexes contg. optically active tertiary phosphines II [A<sub>1</sub>, A<sub>2</sub> = Ph (substituted with halo, lower (halo)alkyl, lower alkoxy)] as ligands. 1-Phenylbutadiene reacted with SiHCl<sub>3</sub> in the presence of (R)-II (A<sub>1</sub> = 3,5-dimethylphenyl, A<sub>2</sub> = Ph) and allylpalladium chloride dimer at 20° for 13.5 h to give 83% of optically active 1-trichlorosilyl-1-phenyl-2-butene (Z/E = 96/4).
- IT 197005-07-5P, (R)-2-(Diphenylphosphino)-2'-(3,5-dimethylphenyl)-1,1'-binaphthyl 197005-08-6P, (R)-2-(Diphenylphosphino)-2'-(4-methoxyphenyl)-1,1'-binaphthyl  
 RL: CAT (Catalyst use); SPN (Synthetic preparation);  
 PREP (Preparation); USES (Uses)  
 (prepn. of optically active organosilicons by regioselective stereoselective silylation of dienes using tertiary phosphine-metal complex catalysts)
- RN 197005-07-5 HCAPLUS
- CN Phosphine, [(1R)-2'-(3,5-dimethylphenyl)[1,1'-binaphthalen]-2-yl]diphenyl- (9CI) (CA INDEX NAME)



- RN 197005-08-6 HCAPLUS
- CN Phosphine, [(1R)-2'-(4-methoxyphenyl)[1,1'-binaphthalen]-2-yl]diphenyl- (9CI) (CA INDEX NAME)



IT 197005-06-4P, (R)-2-(Diphenylphosphinyl)-2'-(3,5-dimethylphenyl)-1,1'-binaphthyl  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
 (prepn. of optically active organosilicons by regioselective stereoselective silylation of dienes using tertiary phosphine-metal complex catalysts)  
 RN 197005-06-4 HCAPLUS  
 CN Phosphine oxide, [2'-(3,5-dimethylphenyl)[1,1'-binaphthalen]-2-yl]diphenyl-, (R)- (9CI) (CA INDEX NAME)



IC ICM C07F009-50  
 ICS B01J031-24; C07B053-00; C07F007-08; C07F007-12; C07F007-14; C07F007-18; C07B061-00; C07M007-00  
 CC 29-6 (Organometallic and Organometalloidal Compounds)  
 Section cross-reference(s): 67  
 IT 12012-95-2, Allylpalladium chloride dimer  
 RL: CAT (Catalyst use); USES (Uses)  
 (prepn. of optically active organosilicons by regioselective stereoselective silylation of dienes using tertiary phosphine-metal complex catalysts)  
 IT 197005-07-5P, (R)-2-(Diphenylphosphino)-2'-(3,5-dimethylphenyl)-1,1'-binaphthyl 197005-08-6P, (R)-2-(Diphenylphosphino)-2'-(4-methoxyphenyl)-1,1'-binaphthyl  
 RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
 (prepn. of optically active organosilicons by regioselective stereoselective silylation of dienes using tertiary phosphine-metal complex catalysts)  
 IT 197005-06-4P, (R)-2-(Diphenylphosphinyl)-2'-(3,5-dimethylphenyl)-1,1'-binaphthyl  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
 (prepn. of optically active organosilicons by regioselective stereoselective silylation of dienes using tertiary

## phosphine-metal complex catalysts)

L26 ANSWER 54 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1997:204039 HCAPLUS

DOCUMENT NUMBER: 126:199669

TITLE: Chiral unsymmetric diphosphine compounds and transition metal complexes containing them as ligands

INVENTOR(S): Sayo, Noboru; Zhang, Xiaoyong; Omoto, Tatsuya; Yokozawa, Tohru; Yamasaki, Tetsuro; Kumobayashi, Hidenori

PATENT ASSIGNEE(S): Takasago International Corporation, Japan

SOURCE: Eur. Pat. Appl., 16 pp.

CODEN: EPXXDW

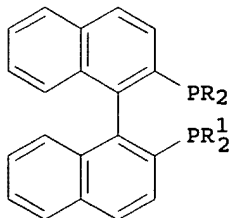
DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO. -----	KIND ----	DATE -----	APPLICATION NO. -----	DATE
EP 754696	A1	19970122	EP 1996-305305	199607 19
			<--	
EP 754696	B1	20020116		
R: CH, DE, FR, GB, IT, LI				
JP 09031084	A2	19970204	JP 1995-206696	199507 21
			<--	
JP 3338243	B2	20021028		
US 5808162	A	19980915	US 1996-683199	199607 18
			<--	
PRIORITY APPLN. INFO.:			JP 1995-206696	A 199507 21

OTHER SOURCE(S): CASREACT 126:199669; MARPAT 126:199669  
GI

AB Novel chiral unsym. diphosphine compds. I, wherein R and R<sup>1</sup>, which are different from each other, each represent a substituted or unsubstituted Ph group, a substituted or unsubstituted naphthyl group, a pyridyl group, a quinolyl group, an isoquinolyl group, a furfuryl group, a benzofurfuryl group, a thienyl group, or a benzothienyl group were prepd. Transition metal complexes contg. the



diphosphine compds. as ligands, where the complex catalyzes various asym. synthesis reactions, e.g., asym. hydrogenation or asym. hydrosilylation, exhibiting excellent performance in selectivity, conversion and catalytic activity, to provide a product of desired abs. configuration at high optical purity and in high yield were also prepd.

IT 132532-04-8P 187741-54-4P 187742-38-7P

187742-73-0P 187742-81-0P 187743-69-7P

187743-87-9P 187744-08-7P 187744-11-2P

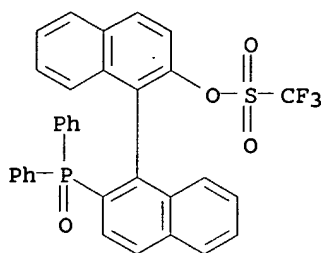
RL: RCT (Reactant); SPN (Synthetic preparation); PREP

(Preparation); RACT (Reactant or reagent)

(in prepn. of diphosphinobinaphthyl compd.)

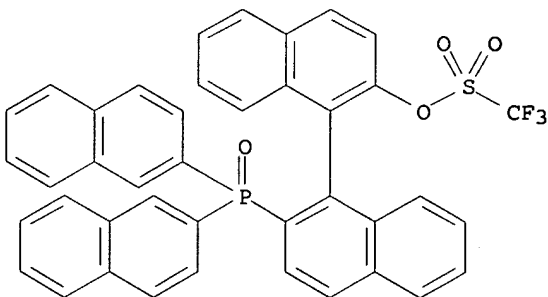
RN 132532-04-8 HCAPLUS

CN Methanesulfonic acid, trifluoro-, (1R)-2'-(diphenylphosphinyl)[1,1'-binaphthalen]-2-yl ester (9CI) (CA INDEX NAME)



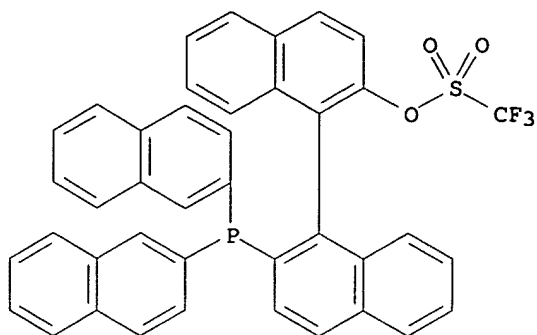
RN 187741-54-4 HCAPLUS

CN Methanesulfonic acid, trifluoro-, (1S)-2'-(di-2-naphthalenylphosphinyl)[1,1'-binaphthalen]-2-yl ester (9CI) (CA INDEX NAME)

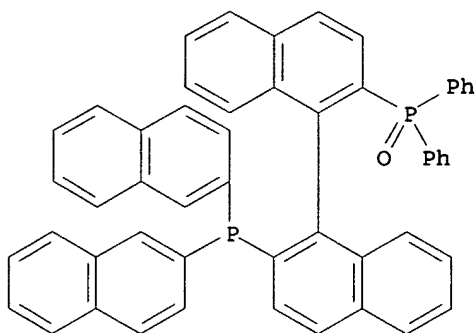


RN 187742-38-7 HCAPLUS

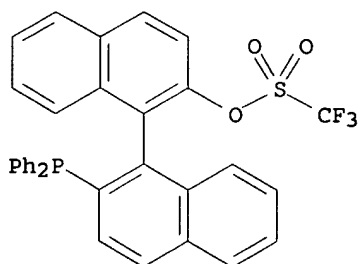
CN Methanesulfonic acid, trifluoro-, (1S)-2'-(di-2-naphthalenylphosphino)[1,1'-binaphthalen]-2-yl ester (9CI) (CA INDEX NAME)



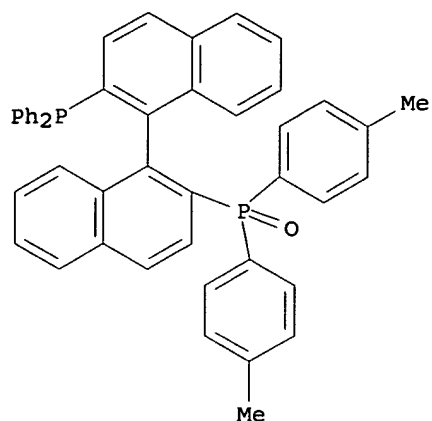
RN 187742-73-0 HCAPLUS  
 CN Phosphine oxide, [2'-(di-2-naphthalenylphosphino)[1,1'-binaphthalen]-2-yl]diphenyl-, (S)- (9CI) (CA INDEX NAME)



RN 187742-81-0 HCAPLUS  
 CN Methanesulfonic acid, trifluoro-, (1R)-2'-(diphenylphosphino)[1,1'-binaphthalen]-2-yl (9CI) (CA INDEX NAME)

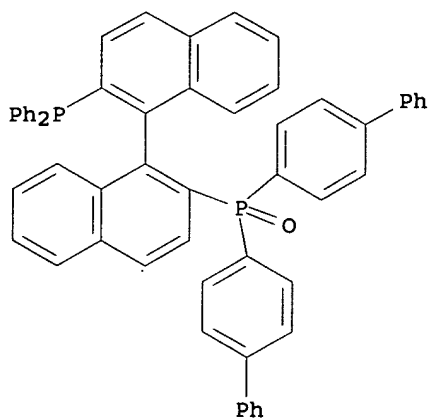


RN 187743-69-7 HCAPLUS  
 CN Phosphine oxide, [2'-(diphenylphosphino)[1,1'-binaphthalen]-2-yl]bis(4-methylphenyl)-, (R)- (9CI) (CA INDEX NAME)



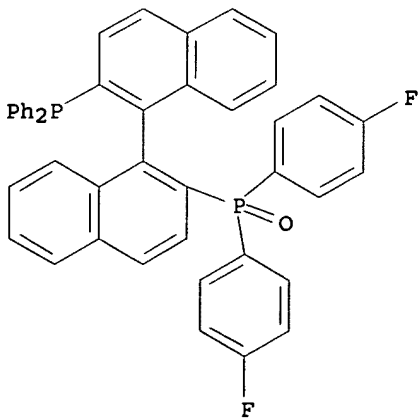
RN 187743-87-9 HCAPLUS

CN Phosphine oxide, bis([1,1'-biphenyl]-4-yl)[2'-(diphenylphosphino)[1,1'-binaphthalen]-2-yl]-, (R)- (9CI) (CA INDEX NAME)

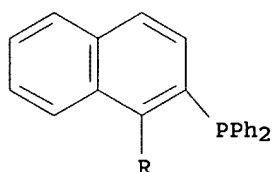
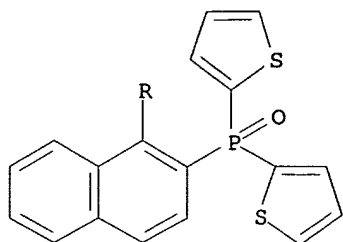


RN 187744-08-7 HCAPLUS

CN Phosphine oxide, [2'-(diphenylphosphino)[1,1'-binaphthalen]-2-yl]bis(4-fluorophenyl)-, (R)- (9CI) (CA INDEX NAME)

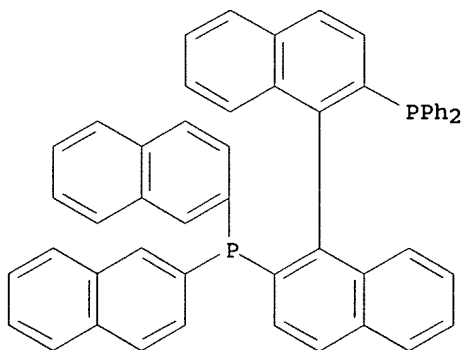


RN 187744-11-2 HCAPLUS  
 CN Phosphine oxide, [2'-(diphenylphosphino)[1,1'-binaphthalen]-2-yl]di-  
 2-thienyl-, (R)- (9CI) (CA INDEX NAME)

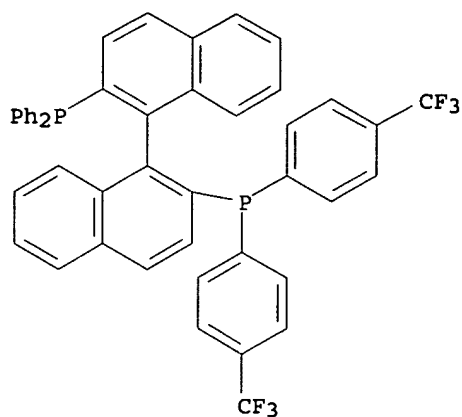


IT 187742-79-6P 187742-82-1P 187744-12-3P  
 187744-13-4P 187744-14-5P 187744-15-6P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP  
 (Preparation); RACT (Reactant or reagent)  
 (prepn. and transition metal complexes from)

RN 187742-79-6 HCAPLUS  
 CN Phosphine, [2'-(di-2-naphthalenylphosphino)[1,1'-binaphthalen]-2-  
 yl]diphenyl-, (S)- (9CI) (CA INDEX NAME)

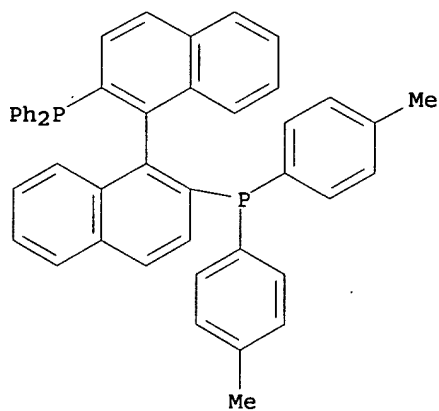


RN 187742-82-1 HCAPLUS  
 CN Phosphine, [2'-[bis[4-(trifluoromethyl)phenyl]phosphino][1,1'-  
 binaphthalen]-2-yl]diphenyl-, (R)- (9CI) (CA INDEX NAME)



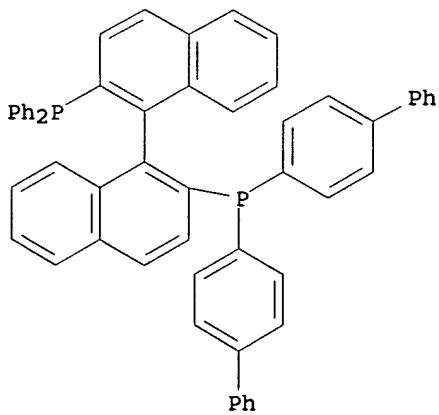
RN 187744-12-3 HCAPLUS

CN Phosphine, [2'-[bis(4-methylphenyl)phosphino][1,1'-binaphthalen]-2-yl]diphenyl-, (R)- (9CI) (CA INDEX NAME)



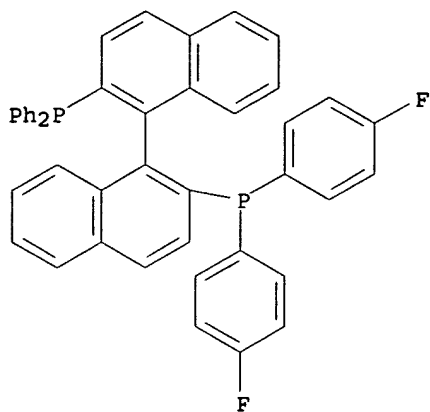
RN 187744-13-4 HCAPLUS

CN Phosphine, bis([1,1'-biphenyl]-4-yl)[2'-(diphenylphosphino)[1,1'-binaphthalen]-2-yl]-, (R)- (9CI) (CA INDEX NAME)



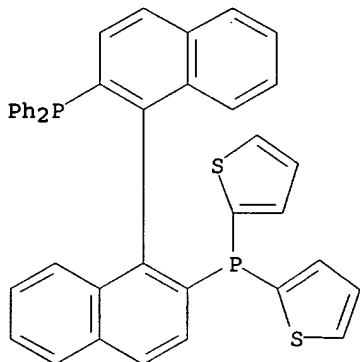
RN 187744-14-5 HCAPLUS

CN Phosphine, [2'-[bis(4-fluorophenyl)phosphino][1,1'-binaphthalen]-2-yl]diphenyl-, (R)- (9CI) (CA INDEX NAME)



RN 187744-15-6 HCAPLUS

CN Phosphine, [2'-(diphenylphosphino)[1,1'-binaphthalen]-2-yl]di-2-thienyl-, (R)- (9CI) (CA INDEX NAME)



IT 187475-95-2P

RL: CAT (Catalyst use); SPN (Synthetic preparation);

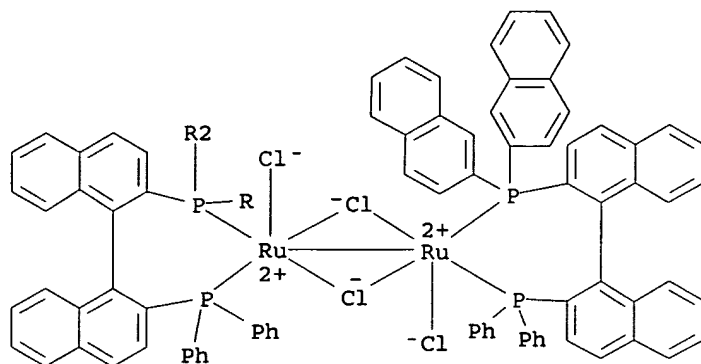
PREP (Preparation); USES (Uses)

(prepn. and use as an asym. hydrogenation catalyst)

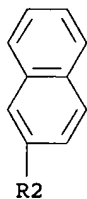
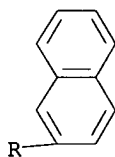
RN 187475-95-2 HCAPLUS

CN Ruthenium, di-μ-chlorodichlorobis[[(1S)-2'-(di-2-naphthalenylphosphino-κP)[1,1'-binaphthalen]-2-yl]diphenylphosphine-κP]di-, (Ru-Ru) (9CI) (CA INDEX NAME)

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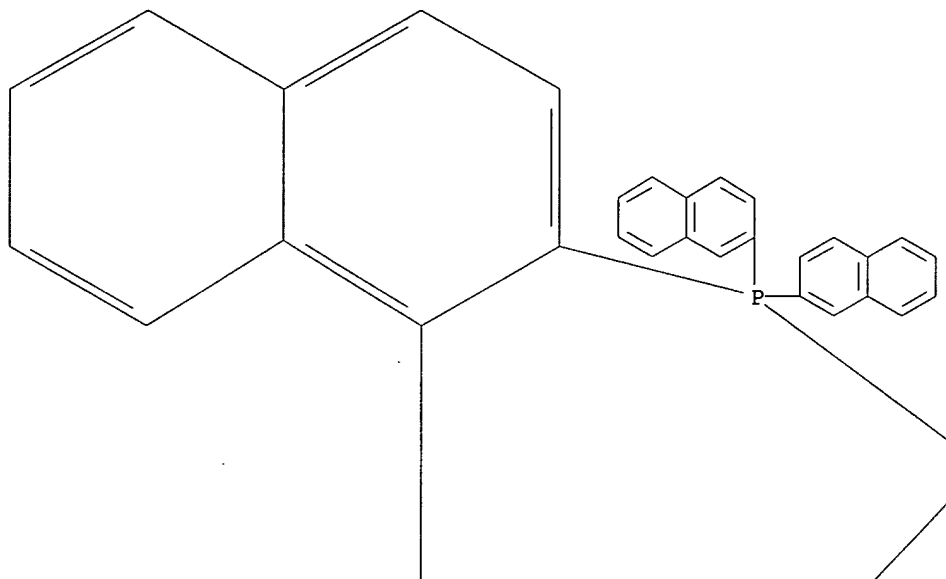


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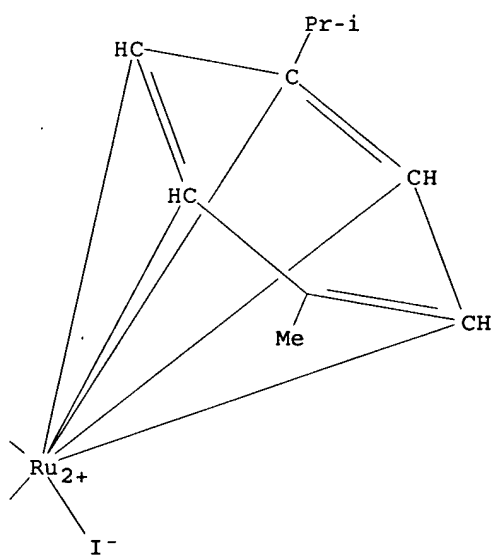


IT 187475-50-9P 187475-54-3P 187475-57-6P  
 187475-62-3P 187475-65-6P 187475-69-0P  
 187475-73-6P 187475-78-1P 187475-82-7P  
 187475-86-1P 187475-89-4P 187475-93-0P  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (prepn. of)  
 RN 187475-50-9 HCAPLUS  
 CN Ruthenium(1+), [[2'-(di-2-naphthalenylphosphino-κP)[1,1'-  
 binaphthalen]-2-yl]diphenylphosphine-κP]iodo[(1,2,3,5,6-η)-  
 4-methyl-1-(1-methylethyl)benzene]-, iodide, stereoisomer (9CI) (CA  
 INDEX NAME)

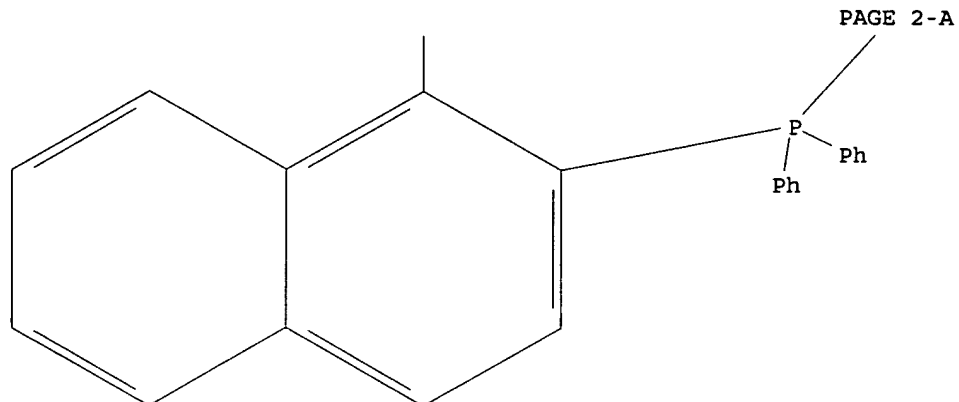
PAGE 1-A



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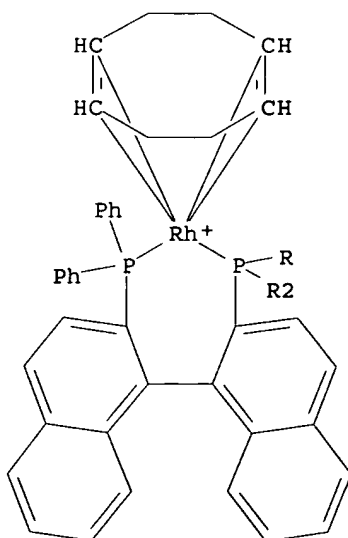


RN 187475-54-3 HCAPLUS  
 CN Rhodium(1+), [(1,2,5,6-η)-1,5-cyclooctadiene][[2'-(di-2-naphthalenylphosphino-κP)[1,1'-binaphthalen]-2-yl]diphenylphosphine-κP]-, stereoisomer, tetrafluoroborate(1-)  
 (9CI) (CA INDEX NAME)

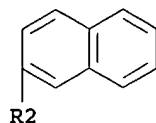
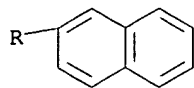
CM 1

CRN 187475-53-2  
 CMF C60 H48 P2 Rh  
 CCI CCS

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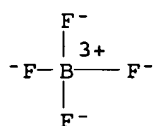


CM 2

CRN 14874-70-5

CMF B F4

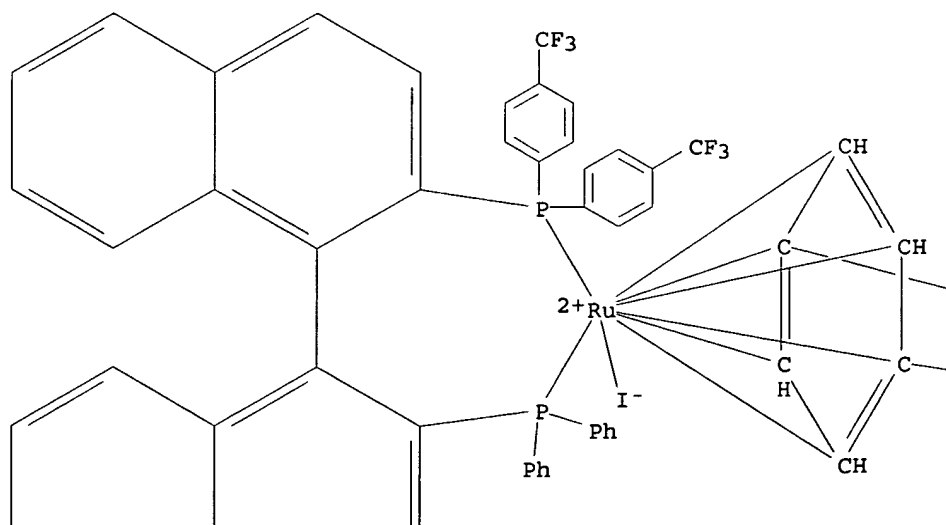
CCI CCS



RN 187475-57-6 HCAPLUS

CN Ruthenium(1+), [[2'-[bis[4-(trifluoromethyl)phenyl]phosphino-  
 κP][1,1'-binaphthalen]-2-yl]diphenylphosphine-  
 κP]iodo[(1,2,3,4,5,6-η)-1-methyl-4-(1-methylethyl)benzene]-  
 , iodide, stereoisomer (9CI) (CA INDEX NAME)

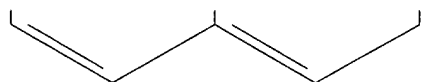
PAGE 1-A



PAGE 1-B

Pr-i

Me



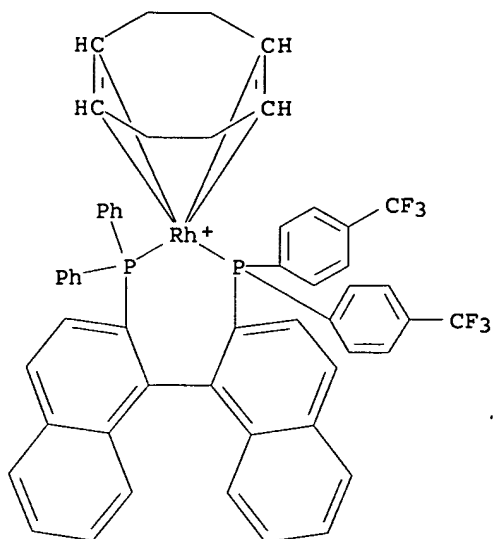
PAGE 2-A

● I<sup>-</sup>

RN 187475-62-3 HCAPLUS  
CN Rhodium(1+), [[2'-[bis[4-(trifluoromethyl)phenyl]phosphino-  
κP][1,1'-binaphthalen]-2-yl]diphenylphosphine-  
κP][(1,2,5,6-η)-1,5-cyclooctadiene]-, stereoisomer,  
tetrafluoroborate(1-) (9CI) (CA INDEX NAME)

CM 1

CRN 187475-61-2  
CMF C54 H42 F6 P2 Rh  
CCI CCS

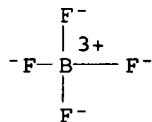


CM 2

CRN 14874-70-5

CMF B F4

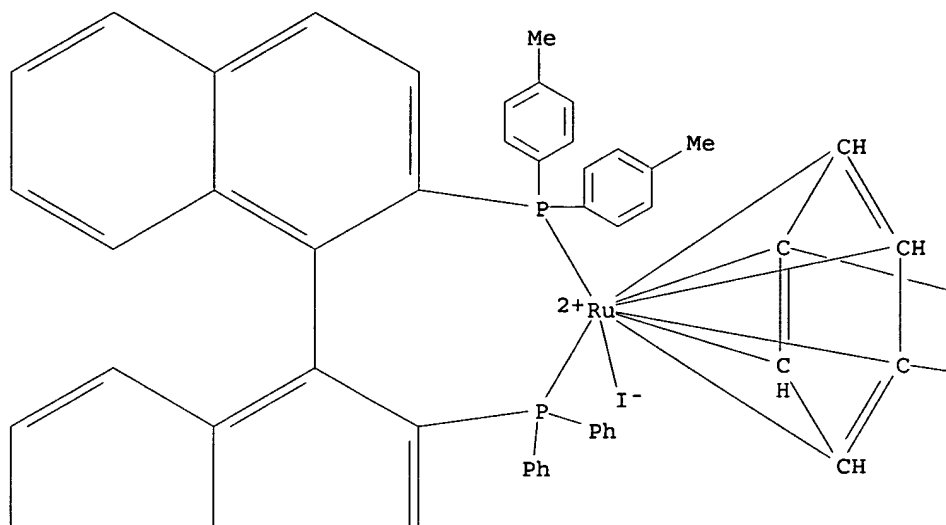
CCI CCS



RN 187475-65-6 HCAPLUS

CN Ruthenium(1+), [[(1R)-2'-[bis(4-methylphenyl)phosphino-  
 $\kappa$ P][1,1'-binaphthalen]-2-yl]diphenylphosphine-  
 $\kappa$ P]iodo[(1,2,3,4,5,6- $\eta$ )-1-methyl-4-(1-methylethyl)benzene]-  
 , iodide (9CI) (CA INDEX NAME)

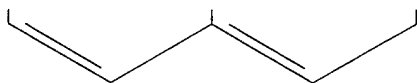
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PAGE 1-B

Pr-i

Me



PAGE 2-A

● I<sup>-</sup>

RN 187475-69-0 HCAPLUS  
 CN Rhodium(1+), [[[1R]-2'-[bis(4-methylphenyl)phosphino-κP][1,1'-binaphthalen]-2-yl]diphenylphosphine-κP][(1,2,5,6-η)-1,5-

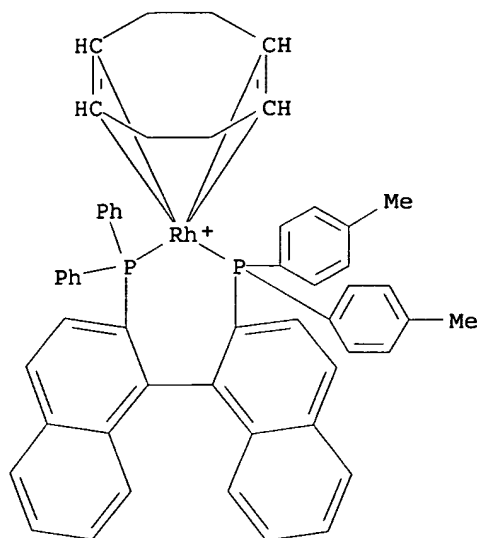
cyclooctadiene]-, tetrafluoroborate(1-) (9CI) (CA INDEX NAME)

CM 1

CRN 187475-68-9

CMF C54 H48 P2 Rh

CCI CCS

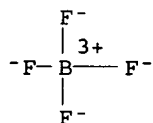


CM 2

CRN 14874-70-5

CMF B F4

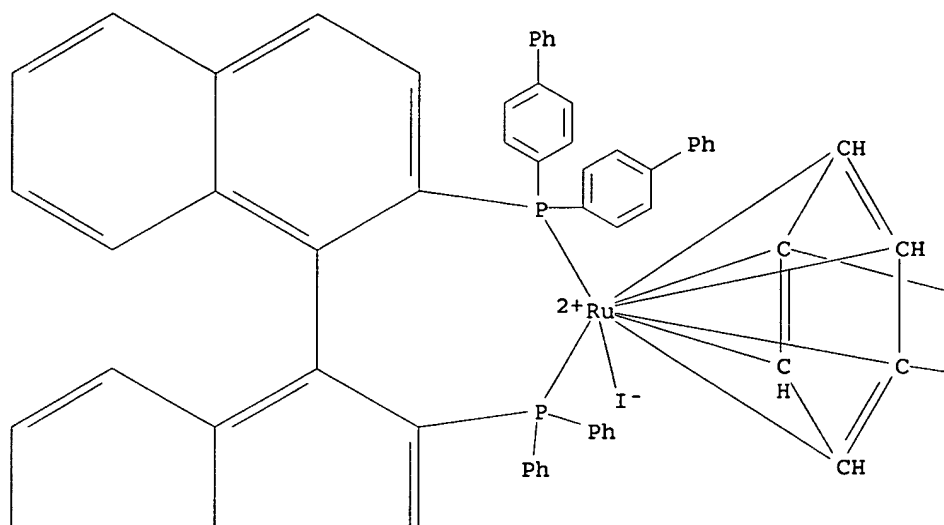
CCI CCS



RN 187475-73-6 HCAPLUS

CN Ruthenium(1+), [bis([1,1'-biphenyl]-4-yl)[(1R)-2'-(diphenylphosphino-κP)[1,1'-binaphthalen]-2-yl]phosphine-κP]iodo[(1,2,3,4,5,6-η)-1-methyl-4-(1-methylethyl)benzene]-, iodide (9CI) (CA INDEX NAME)

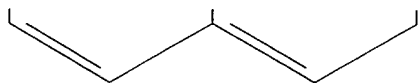
PAGE 1-A



PAGE 1-B

Pr-i

Me



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● I<sup>-</sup>

RN 187475-78-1 HCAPLUS  
 CN Rhodium(1+), [bis([1,1'-biphenyl]-4-yl)[(1R)-2'-(diphenylphosphino- $\kappa$ P)[1,1'-binaphthalen]-2-yl]phosphine- $\kappa$ P][(1,2,5,6-

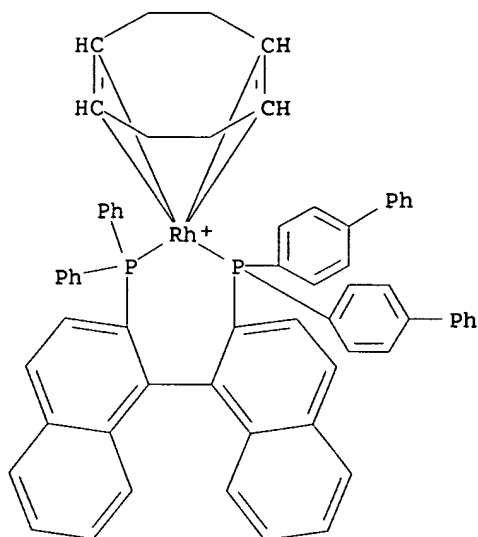
$\eta$ -1,5-cyclooctadiene]-, tetrafluoroborate(1-) (9CI) (CA INDEX NAME)

CM 1

CRN 187475-77-0

CMF C64 H52 P2 Rh

CCI CCS

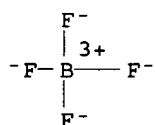


CM 2

CRN 14874-70-5

CMF B F4

CCI CCS

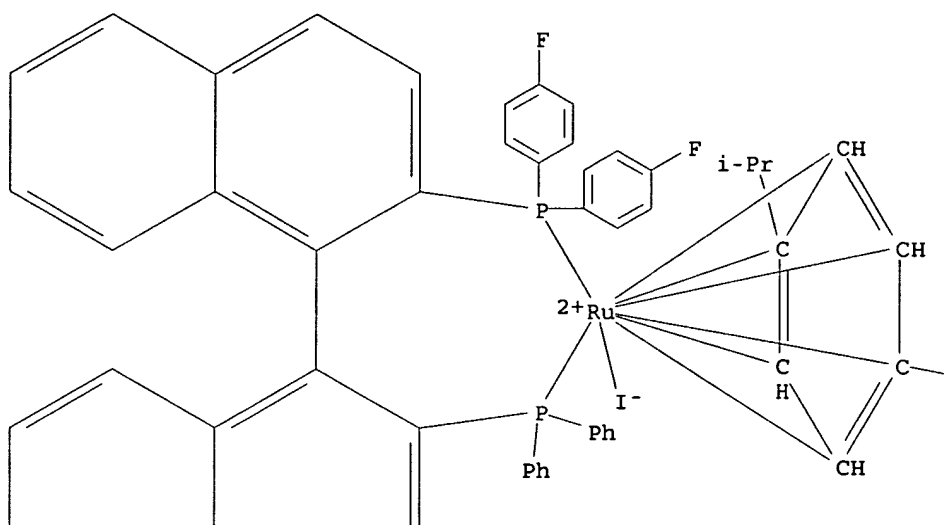


RN 187475-82-7 HCAPLUS

CN Ruthenium(1+), [[[1R]-2'-[bis(4-fluorophenyl)phosphino- $\kappa$ P][1,1'-binaphthalen]-2-yl]diphenylphosphine- $\kappa$ P]iodo[(1,2,3,4,5,6- $\eta$ )-1-methyl-4-(1-methylethyl)benzene]-, iodide (9CI) (CA INDEX NAME)

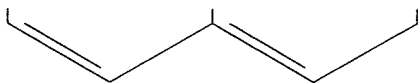


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Me



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● I<sup>-</sup>

RN 187475-86-1 HCAPLUS  
 CN Rhodium(1+), [[(1R)-2'-[bis(4-fluorophenyl)phosphino-κP][1,1'-binaphthalen]-2-yl]diphenylphosphine-κP][(1,2,5,6-η)-1,5-

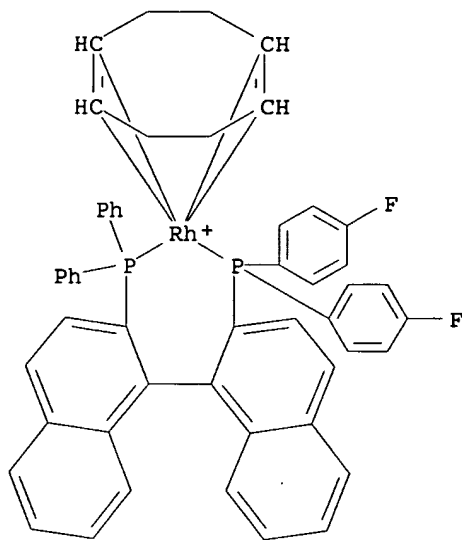
cyclooctadiene]-, tetrafluoroborate(1-) (9CI) (CA INDEX NAME)

CM 1

CRN 187475-85-0

CMF C52 H42 F2 P2 Rh

CCI CCS

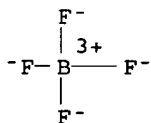


CM 2

CRN 14874-70-5

CMF B F4

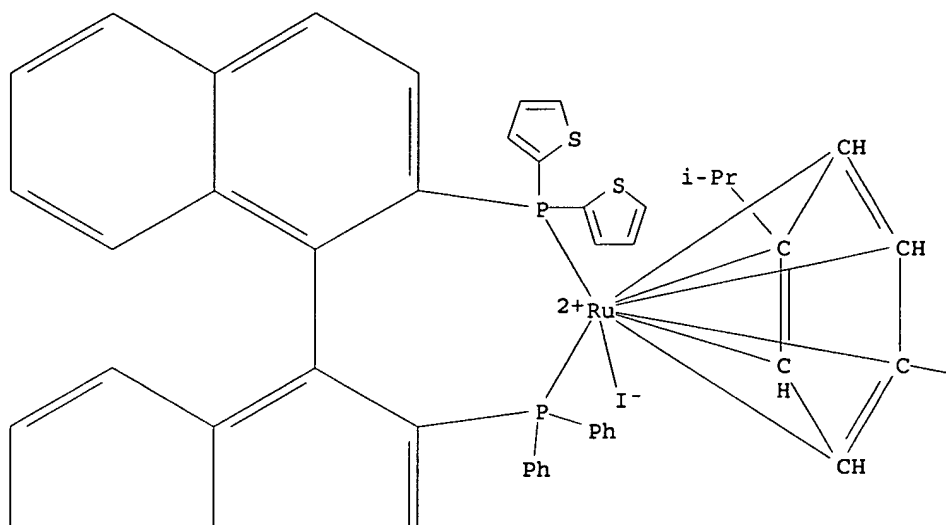
CCI CCS



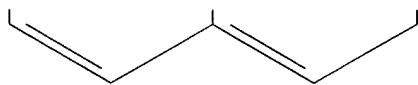
RN 187475-89-4 HCAPLUS

CN Ruthenium(1+), [[[1R)-2'-(diphenylphosphino-κP)[1,1'-binaphthalen]-2-yl]di-2-thienylphosphine-κP]iodo[(1,2,3,4,5,6-η)-1-methyl-4-(1-methylethyl)benzene]-, iodide (9CI) (CA INDEX NAME)

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RN 187475-93-0 HCAPLUS  
CN Rhodium(1+), [(1,2,5,6-η)-1,5-cyclooctadiene[[{(1R)-2'-(diphenylphosphino-κP) [1,1'-binaphthalen]-2-yl]di-2-

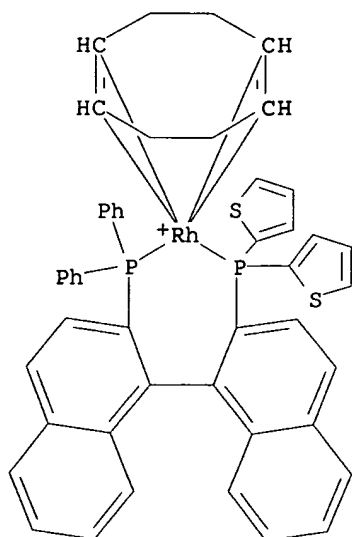
thienylphosphine-κP]]-, tetrafluoroborate(1-) (9CI) (CA INDEX NAME)

CM 1

CRN 187475-92-9

CMF C48 H40 P2 Rh S2

CCI CCS

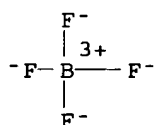


CM 2

CRN 14874-70-5

CMF B F4

CCI CCS



- IC ICM C07F009-50  
ICS C07F009-53; C07F009-6553; C07F015-00; C07B053-00
- CC 29-7 (Organometallic and Organometalloidal Compounds)  
Section cross-reference(s): 25, 27
- IT 14647-23-5  
RL: CAT (Catalyst use); USES (Uses)  
(catalyst for prepn. of diphosphinobinaphthyl compds.)
- IT 128544-05-8P 132532-04-8P 187741-54-4P  
187742-38-7P 187742-73-0P 187742-81-0P  
187743-69-7P 187743-87-9P 187744-08-7P  
187744-11-2P  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP  
(Preparation); RACT (Reactant or reagent)  
(in prepn. of diphosphinobinaphthyl compd.)
- IT 187742-79-6P 187742-82-1P 187744-12-3P  
187744-13-4P 187744-14-5P 187744-15-6P  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP  
(Preparation); RACT (Reactant or reagent)

(prepn. and transition metal complexes from)

IT 187475-95-2P  
 RL: CAT (Catalyst use); SPN (Synthetic preparation);  
 PREP (Preparation); USES (Uses)  
 (prepn. and use as an asym. hydrogenation catalyst)

IT 76905-13-0P 187475-50-9P 187475-54-3P  
 187475-57-6P 187475-62-3P 187475-65-6P  
 187475-69-0P 187475-73-6P 187475-78-1P  
 187475-82-7P 187475-86-1P 187475-89-4P  
 187475-93-0P  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (prepn. of)

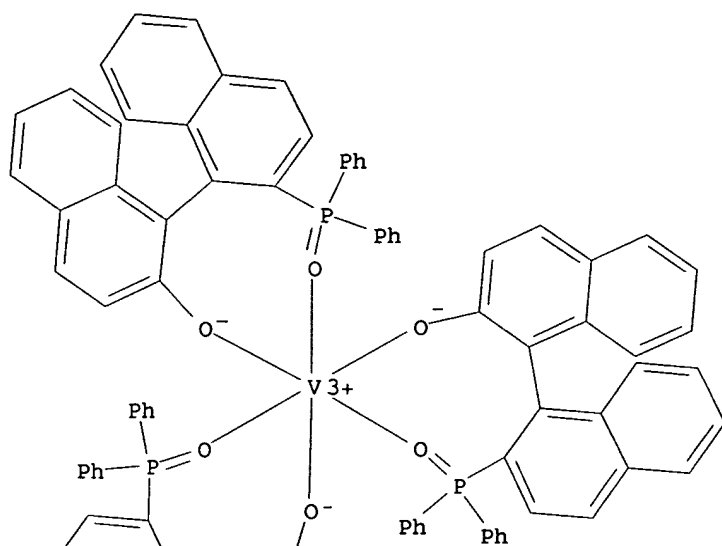
L26 ANSWER 55 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 1997:10721 HCAPLUS  
 DOCUMENT NUMBER: 126:126078  
 TITLE: (R)- and (S)-2-Diphenylphosphinoyl-2'-hydroxy-  
 1,1'-binaphthalene: versatile chiral bidentate  
 ligands  
 AUTHOR(S): Cross, Ronald J.; Farrugia, Louis J.; Newman,  
 Paul D.; Peacock, Robert D.; Stirling, Diane  
 CORPORATE SOURCE: Department Chemistry, University Glasgow,  
 Glasgow, G128QQ, UK  
 SOURCE: Journal of the Chemical Society, Dalton  
 Transactions: Inorganic Chemistry (1996  
 ), (23), 4449-4458  
 CODEN: JCDBTBI; ISSN: 0300-9246  
 PUBLISHER: Royal Society of Chemistry  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English

AB The homochiral compds. (R)- and (S)-2-diphenylphosphinoyl-2'-hydroxy-  
 1,1'-binaphthalene, (R)- and (S)-Hbinappo, react with  $\text{TiCl}_4(\text{THF})_2$  or  
 $\text{ZrCl}_4(\text{THF})_2$  to produce complexes of bidentate binappo-,  
 $[\text{MCl}_2(\text{binappo})_2]$  ( $\text{M} = \text{TiIV}$  or  $\text{ZrIV}$ ).  $\text{VCl}_3(\text{THF})_3$ ,  $\text{FeCl}_3$  and  $\text{MoO}_2\text{Cl}_2$   
 also react with Hbinappo, but require the presence of a base to  
 produce  $[\text{M}(\text{binappo})_3]$  ( $\text{M} = \text{VIII}$  or  $\text{FeIII}$ ) or  $[\text{MoO}_2(\text{binappo})_2]$ .  
 $[\text{MoO}_2(\text{acac})_2]$  ( $\text{acac} = \text{acetylacetonate}$ ) reacts with Hbinappo to  
 produce  $[\text{MoO}_2(\text{acac})(\text{binappo})]$ . The V(III) tris(chelate) complexes  
 are readily oxidized in air to  $[\text{VO}(\text{binappo})_2]$ . All of these  
 complexes were characterized by microanal., IR, and, where  
 appropriate, NMR, electronic and CD spectroscopic techniques.  
 (S)-Hbinappo,  $[\text{ZrCl}_2\{(\text{S})\text{-binappo}\}_2]$ ,  $[\text{V}\{(\text{S})\text{-binappo}\}_3]$  and  
 $[\text{VO}\{(\text{S})\text{-binappo}\}_2]$  also were characterized by single crystal x-ray  
 techniques. In all of the complexes the ligands are coordinated  
 through their phenolate and phosphinoyl O atoms forming  
 eight-membered chelate rings. The tris-chelate complexes form  
 stereospecifically, (S)-binappo giving the  $\Lambda$  isomer  
 exclusively, and the (R)-form producing  $\Delta$ - $[\text{M}(\text{binappo})_3]$ .  
 Although each of the  $[\text{M}(\text{binappo})_3]$  species are necessarily  
 sterically crowded, little M-O bond elongation is obsd. in the  
 single-crystal x-ray structure of  $[\text{V}\{(\text{S})\text{binappo}\}_3]$ . Initial  
 attempts at achieving asym. induction in TiIV- and VOIV-based  
 oxidns. of prochiral sulfides in the presence of these ligands are  
 also presented, but obsd. enantiomeric excesses are generally <10%.

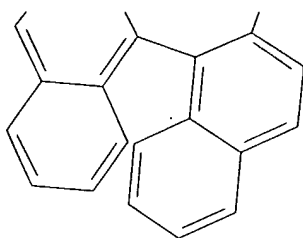
IT 186148-11-8P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP  
 (Preparation); RACT (Reactant or reagent)  
 (prepn. and air oxidn. of)

RN 186148-11-8 HCAPLUS  
 CN Vanadium, tris[2'-(diphenylphosphinyl- $\kappa\text{O}$ )[1,1'-binaphthalen]-2-  
 olato- $\kappa\text{O}$ ]-, [OC-6-22-A-(R),(R),(R)]- (9CI) (CA INDEX  
 NAME)

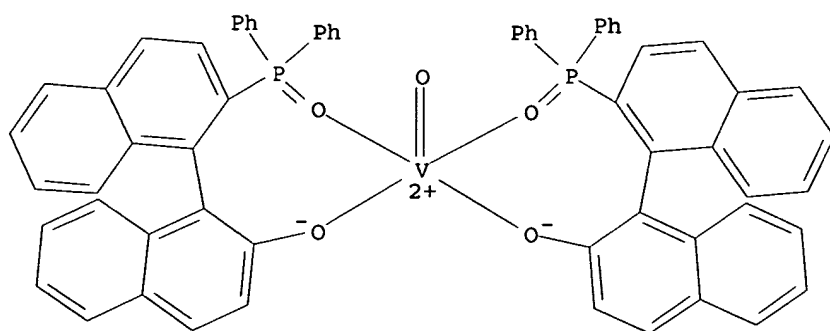
PAGE 1-A



PAGE 2-A



IT 186148-12-9P  
 RL: CAT (Catalyst use); SPN (Synthetic preparation);  
 PREP (Preparation); USES (Uses)  
 (prepn. and catalyst for attempted asym. oxidn. of sulfide to  
 sulfoxide)  
 RN 186148-12-9 HCAPLUS  
 CN Vanadium, bis[2'-(diphenylphosphinyl-κO) [1,1'-binaphthalen]-2-  
 olato-κO]oxo-, [SP-5-31-(R), (R)]- (9CI) (CA INDEX NAME)



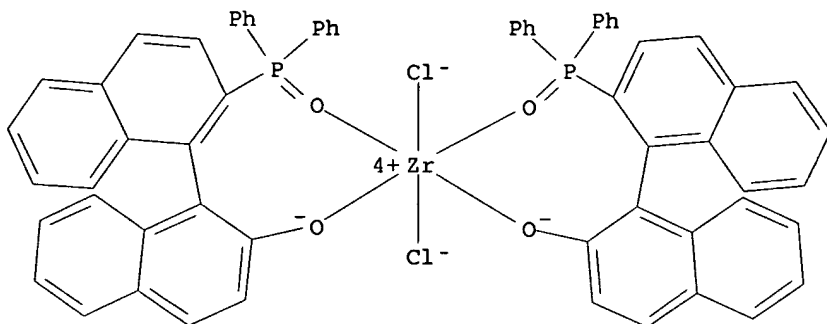
IT 186083-76-1P 186083-80-7P

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(prepn. and crystal structure of)

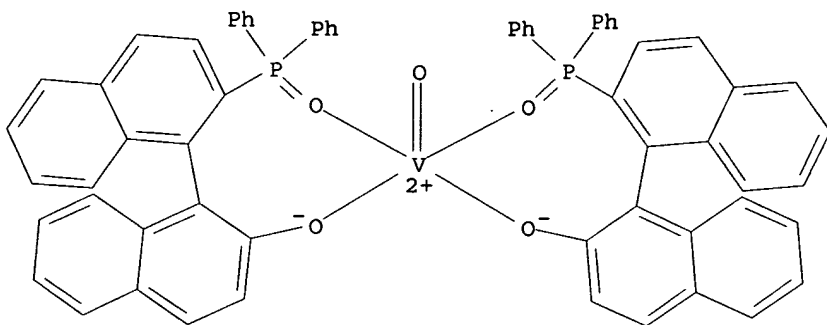
RN 186083-76-1 HCAPLUS

CN Zirconium, dichlorobis[2'-(diphenylphosphinyl- $\kappa$ O) [1,1'-binaphthalen]-2-olato- $\kappa$ O]-, [OC-6-32- $\Lambda$ -(S),(S)]- (9CI) (CA INDEX NAME)



RN 186083-80-7 HCAPLUS

CN Vanadium, bis[2'-(diphenylphosphinyl- $\kappa$ O) [1,1'-binaphthalen]-2-olato- $\kappa$ O]oxo-, [SP-5-31-(S),(S)]- (9CI) (CA INDEX NAME)

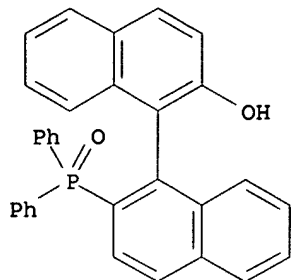


IT 186146-45-2P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent) (prepn. and reaction with ferric chloride)

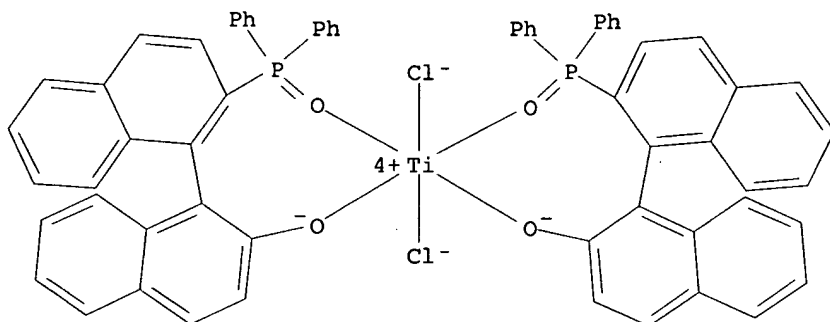
RN 186146-45-2 HCAPLUS

CN [1,1'-Binaphthalen]-2-ol, 2'-(diphenylphosphinyl)-, potassium salt, (S)- (9CI) (CA INDEX NAME)



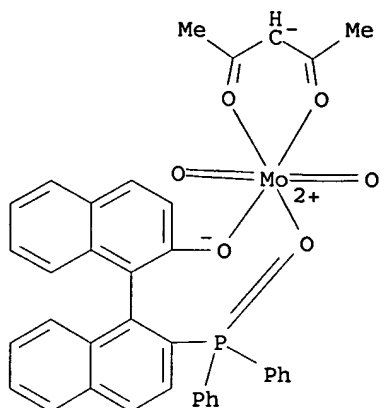
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IT 186083-75-0P 186083-77-2P 186083-78-3P  
 186083-81-8P 186083-82-9P 186148-10-7P  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (prepn. of)  
 RN 186083-75-0 HCAPLUS  
 CN Titanium, dichlorobis[2'-(diphenylphosphinyl-κO) [1,1'-  
 binaphthalen]-2-olato-κO]-, [OC-6-13-(S),(S)]- (9CI) (CA  
 INDEX NAME)



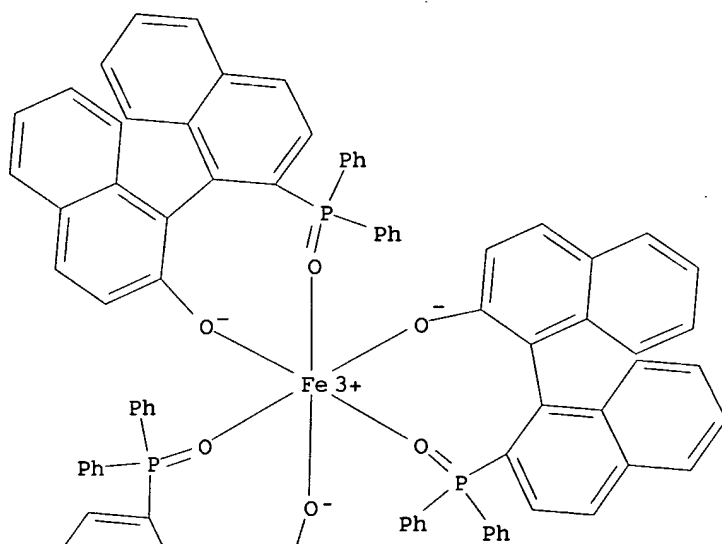
RN 186083-77-2 HCAPLUS  
 CN Molybdenum, [2'-(diphenylphosphinyl-κO) [1,1'-binaphthalen]-2-  
 olato-κO]dioxo(2,4-pentanedionato-κO,κO')-,  
 [OC-6-44-(S)]- (9CI) (CA INDEX NAME)



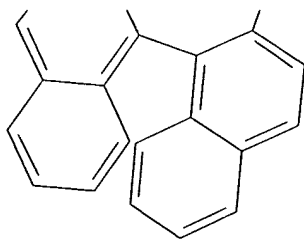


RN 186083-78-3 HCAPLUS  
 CN Iron, tris[2'-(diphenylphosphinyl-κO) [1,1'-binaphthalen]-2-  
 olato-κO]-, [OC-6-22-A-(S),(S),(S)]- (9CI) (CA INDEX  
 NAME)

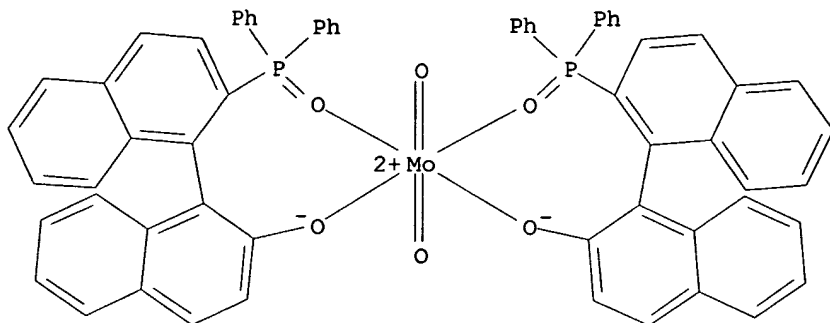
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PAGE 2-A

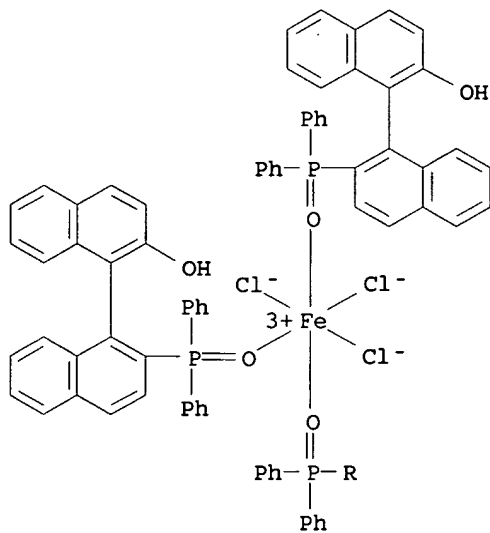


RN 186083-81-8 HCAPLUS  
 CN Molybdenum, bis[2'-(diphenylphosphinyl-κO)[1,1'-binaphthalen]-2-olato-κO]dioxo-, [OC-6-33-(S),(S)]- (9CI) (CA INDEX NAME)

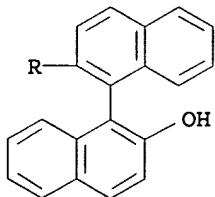


RN 186083-82-9 HCAPLUS  
 CN Iron, trichlorotris[2'-(diphenylphosphinyl-κO)[1,1'-binaphthalen]-2-ol]-, [OC-6-22-(R),(R),(R)]- (9CI) (CA INDEX NAME)

PAGE 1-A



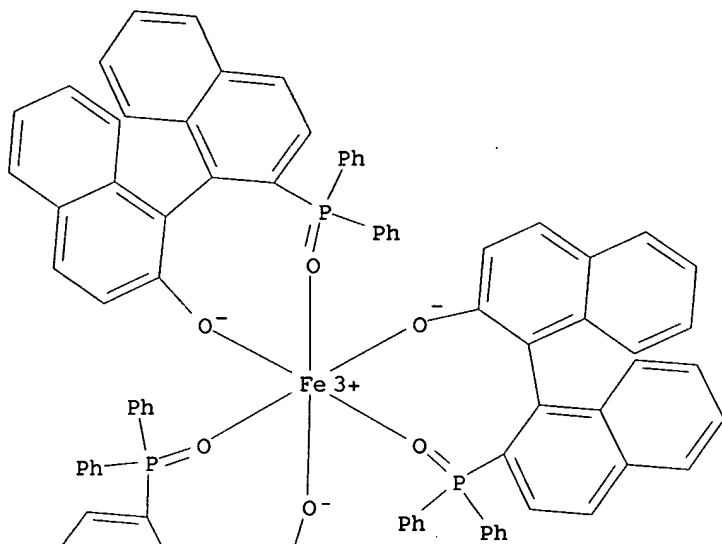
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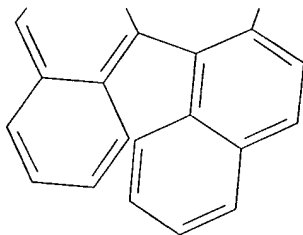
RN 186148-10-7 HCAPLUS  
 CN Iron, tris[2'-(diphenylphosphinyl-κO)[1,1'-binaphthalen]-2-

olato- $\kappa$ O]-, [OC-6-22- $\Delta$ -(R),(R),(R)]- (9CI) (CA INDEX  
NAME)

PAGE 1-A

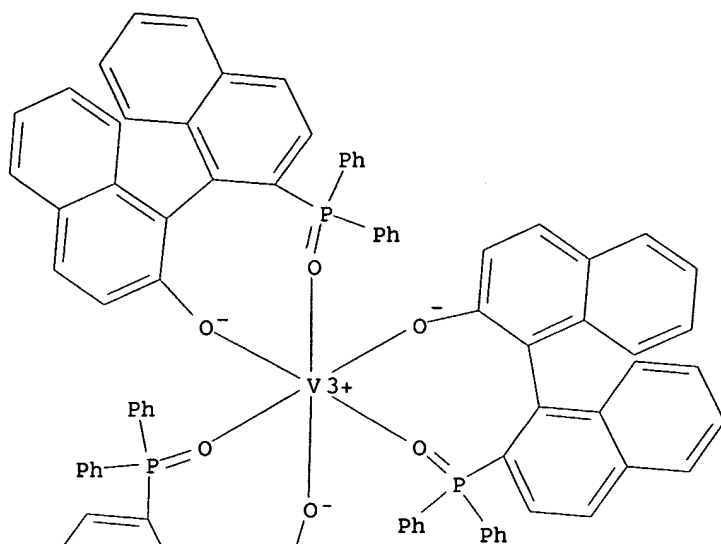


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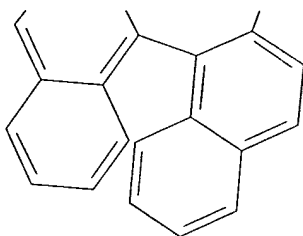


IT 186083-79-4P  
 RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation);  
 PREP (Preparation); RACT (Reactant or reagent)  
 (prepn., air oxidn., and crystal structure of)  
 RN 186083-79-4 HCAPLUS  
 CN Vanadium, tris[2'-(diphenylphosphinyl- $\kappa$ O)[1,1'-binaphthalen]-2-  
 olato- $\kappa$ O]-, [OC-6-22- $\Delta$ -(S),(S),(S)]- (9CI) (CA INDEX  
 NAME)

PAGE 1-A



PAGE 2-A



- CC 78-7 (Inorganic Chemicals and Reactions)  
 Section cross-reference(s): 67, 75
- ST crystal structure diphenylphosphinoylhydroxybinaphthalene titanium zirconium; structure diphenylphosphinoylhydroxybinaphthalene ligand titanium zirconium complex; binaphthalene diphenylphosphinoyl hydroxy chiral bidentate ligand; hydroxybinaphthylphosphine chiral transition metal complex prepn; transition metal diphenylphosphinoylhydroxybinaphthalene chiral prepn structure; oxidn catalyst asym diphenylphosphinoylhydroxybinaphthalene titanium vanadyl; chiral auxiliary diphenylphosphinoylhydroxybinaphthalene ligand oxidn catalyst
- IT Transition metal complexes  
 RL: CAT (Catalyst use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
 (diphenylphosphinoyl(hydroxy)binaphthalene; prepn., crystal structure, and catalysts for attempted asym. oxidn. of sulfide to sulfoxide)
- IT 546-68-9, Titanium isopropoxide  
 RL: CAT (Catalyst use); USES (Uses)  
 (attempted asym. oxidn. of sulfide to sulfoxide catalyzed by metal complexes contg. homochiral diphenylphosphinoylhydroxybinaphthalene ligand)

IT 132548-91-5  
 RL: CAT (Catalyst use); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)  
 (complexation with transition metals, and chiral auxiliary in attempted catalytic asym. oxidn. of sulfide to sulfoxide with titanium isopropoxide)

IT 137769-33-6  
 RL: CAT (Catalyst use); PRP (Properties); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)  
 (crystal structure, complexation with transition metals, and chiral auxiliary in attempted catalytic asym. oxidn. of sulfide to sulfoxide with titanium isopropoxide)

IT 186148-11-8P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
 (prepn. and air oxidn. of)

IT 186148-12-9P  
 RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
 (prepn. and catalyst for attempted asym. oxidn. of sulfide to sulfoxide)

IT 186083-76-1P 186083-80-7P  
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
 (prepn. and crystal structure of)

IT 186146-45-2P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
 (prepn. and reaction with ferric chloride)

IT 186083-75-0P 186083-77-2P 186083-78-3P  
 186083-81-8P 186083-82-9P 186148-10-7P  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (prepn. of)

IT 186083-79-4P  
 RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
 (prepn., air oxidn., and crystal structure of)

REFERENCE COUNT: 28 THERE ARE 28 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L26 ANSWER 56 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 1996:618808 HCAPLUS  
 DOCUMENT NUMBER: 125:248106  
 TITLE: Optically active asymmetric diphosphines and process for producing optically active substance in its presence  
 INVENTOR(S): Takaya, Hidemasa; Ota, Tetsuo; Inagaki, Koji  
 PATENT ASSIGNEE(S): Takasago International Corporation, Japan  
 SOURCE: Eur. Pat. Appl., 11 pp.  
 CODEN: EPXXDW  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 732337	A1	19960918	EP 1996-301720	19960313
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EP 732337	B1	20000906		
R: CH, DE, FR, GB, IT, LI				
JP 08245664	A2	19960924	JP 1995-80836	

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US 5648548

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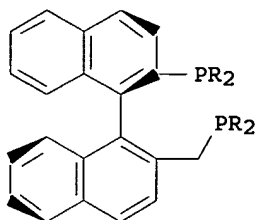
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13

PRIORITY APPLN. INFO.:

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JP 1995-80836

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14OTHER SOURCE(S):  
GI<--  
CASREACT 125:248106; MARPAT 125:248106

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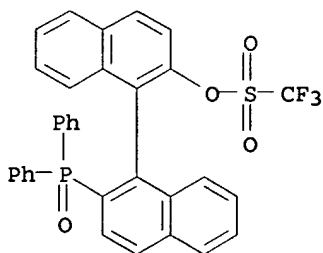
AB An optically active 2-diphenylphosphinomethyl-2'-diphenylphosphino-1,1'-binaphthalene deriv. represented by the general formula (I) wherein R represents a Ph group, a tolyl group, an anisyl group or a chlorophenyl group, and a process for the prodn. of optically active substances in which the above compd. and a **transition metal compd.** were used is described. The asym. **diphosphine** of the present invention is related to the creation of novel compds., which is excellent as a **ligand** for asym. **synthesis** use. When the above compds. were used together with a **transition metal compd.** such as of Ru, Rh or the like, it shows markedly excellent properties as a catalyst of asym. hydrogenation and the like reactions, in terms of selectivity, conversion ratio, catalytic activity and the like.

IT 132532-04-8P 156456-68-7P 156456-69-8P  
156456-71-2P 156456-73-4P 182115-73-7P  
182115-74-8P 182115-75-9P

RL: RCT (Reactant); SPN (Synthetic preparation); **PREP** (**Preparation**); RACT (Reactant or reagent)  
(prepn. and bis(diphenylphosphino)binaphthalene from)

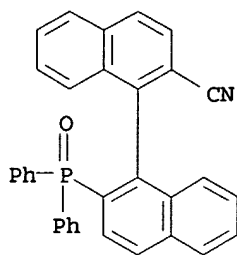
RN 132532-04-8 HCAPLUS

CN Methanesulfonic acid, trifluoro-, (1R)-2'-(diphenylphosphinyl)[1,1'-binaphthalen]-2-yl ester (9CI) (CA INDEX NAME)



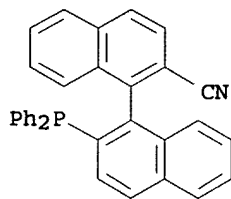
RN 156456-68-7 HCAPLUS

CN [1,1'-Binaphthalene]-2-carbonitrile, 2'-(diphenylphosphinyl)-, (1R)- (9CI) (CA INDEX NAME)



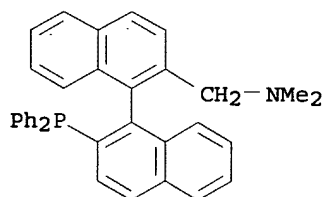
RN 156456-69-8 HCAPLUS

CN [1,1'-Binaphthalene]-2-carbonitrile, 2'-(diphenylphosphino)-, (R)-  
(9CI) (CA INDEX NAME)



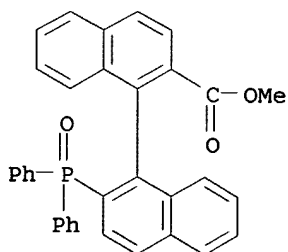
RN 156456-71-2 HCAPLUS

CN [1,1'-Binaphthalene]-2-methanamine, 2'-(diphenylphosphino)-N,N-  
dimethyl-, (R)- (9CI) (CA INDEX NAME)



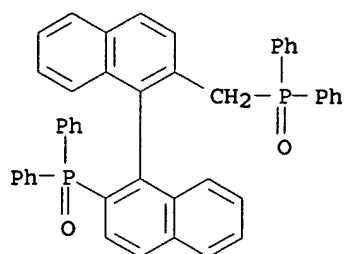
RN 156456-73-4 HCAPLUS

CN [1,1'-Binaphthalene]-2-carboxylic acid, 2'-(diphenylphosphinyl)-,  
methyl ester, (R)- (9CI) (CA INDEX NAME)



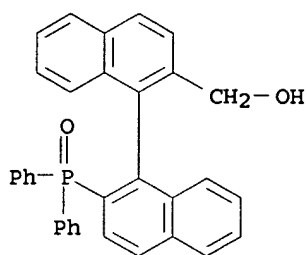
RN 182115-73-7 HCAPLUS

CN Phosphine oxide, [(2'-(diphenylphosphinyl)[1,1'-binaphthalen]-2-  
yl)methyl]diphenyl-, (R)- (9CI) (CA INDEX NAME)



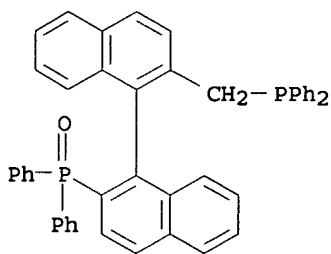
RN 182115-74-8 HCAPLUS

CN [1,1'-Binaphthalene]-2-methanol, 2'-(diphenylphosphinyl)-, (R)-  
(9CI) (CA INDEX NAME)



RN 182115-75-9 HCAPLUS

CN Phosphine oxide, [[2'-(diphenylphosphino)methyl][1,1'-binaphthalen]-2-yl]diphenyl-, (R)- (9CI) (CA INDEX NAME)



IT 182115-72-6P

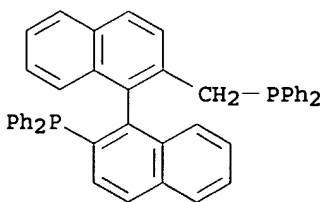
RL: CAT (Catalyst use); SPN (Synthetic preparation);

PREP (Preparation); USES (Uses)

(prepn. and catalysts for asym. hydrogenation)

RN 182115-72-6 HCAPLUS

CN Phosphine, [[2'-(diphenylphosphino)[1,1'-binaphthalen]-2-yl]methyl]diphenyl-, (R)- (9CI) (CA INDEX NAME)



IC ICM C07F009-50



ICS C07B053-00; C07C005-03; B01J031-24  
 ICI C07M007-00  
 CC 29-7 (Organometallic and Organometalloidal Compounds)  
 Section cross-reference(s): 25  
 IT 12092-47-6, Chloro(cyclooctadiene)rhodium dimer  
 RL: CAT (Catalyst use); USES (Uses)  
 (catalyst contg. bis(diphenylphosphino)binaphthalene for asym.  
 hydrogenation of styrenes)  
 IT 182179-31-3P 182179-32-4P 182179-33-5P  
 RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP  
 (Preparation); USES (Uses)  
 (optically active; prepn. and catalysts for asym. hydrogenation)  
 IT 126613-06-7P, (R)-2,2'-Bis(trifluoromethanesulfonyloxy)-1,1'-  
 binaphthyl 126613-07-8P 132532-04-8P  
 156456-68-7P 156456-69-8P 156456-71-2P  
 156456-73-4P 182115-73-7P 182115-74-8P  
 182115-75-9P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP  
 (Preparation); RACT (Reactant or reagent)  
 (prepn. and bis(diphenylphosphino)binaphthalene from)  
 IT 182115-72-6P  
 RL: CAT (Catalyst use); SPN (Synthetic preparation);  
 PREP (Preparation); USES (Uses)  
 (prepn. and catalysts for asym. hydrogenation)

L26 ANSWER 57 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1996:610021 HCAPLUS

DOCUMENT NUMBER: 125:248105

TITLE: Optically active tertiary phosphine  
 compounds, transition metal  
 complexes comprising the same as ligands  
 and process for preparing optically  
 active organic silicon compounds using said  
 transition metal complexes

INVENTOR(S): Hayashi, Tamio; Minai, Masayoshi; Iwakura,  
 Kazunori

PATENT ASSIGNEE(S): Sumitomo Chemical Company Limited, Japan

SOURCE: Eur. Pat. Appl., 20 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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EP 731105	A1	19960911	EP 1996-103689	199603 08
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EP 731105	B1	20011205		
R: CH, DE, GB, LI				
JP 08245662	A2	19960924	JP 1995-51094	199503 10
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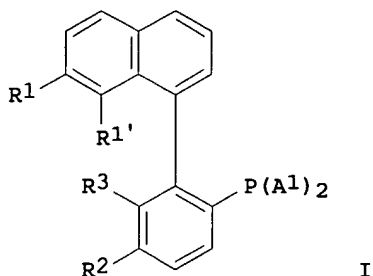
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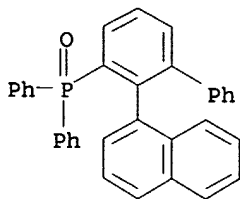
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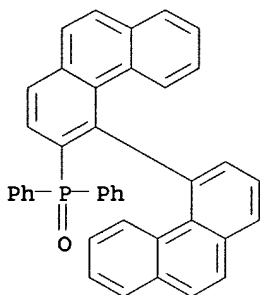
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CASREACT 125:248105; MARPAT 125:248105

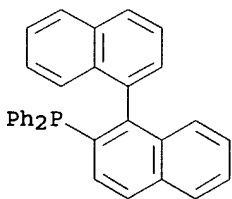
- AB The prepn. of tertiary phosphine compds. I ( $R_1, R_1' = H, R_1R_1' = CH:CHCH:CH$ ;  $R_2R_3 = 2-CH:CHC_6H_4$ , etc.;  $R_2 = H, R_3 =$  substituted or unsubstituted alkyl, Ph group, etc.;  $A_1 = 3$ -trifluoromethylphenyl or 3,5-bis(trifluoromethyl)phenyl, etc.) was given. I was used as cocatalyst to prep. optically active silicon compd. Thus, (S)-3-diphenylphosphino-4,4'-biphenanthryl (prepn. given)/allylpalladium chloride dimer catalyzed silylation of styrene with trichlorosilane gave 1-phenyl-1-trichlorosilylethene. Oxidative desilylation of 1-phenyl-1-trichlorosilylethene with  $KF/KHCO_3/H_2O_2$  in THF/MeOH gave optically pure (R)-1-phenethyl alc. in 95% yield.
- IT 170647-33-3P 181934-58-7P, (S)-3-Diphenylphosphinyl-4,4'-biphenanthryl  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent) (prepn. and deoxygenation of)
- RN 170647-33-3 HCAPLUS
- CN Phosphine oxide, [(2S)-2-(1-naphthalenyl)[1,1'-biphenyl]-3-yl]diphenyl- (9CI) (CA INDEX NAME)



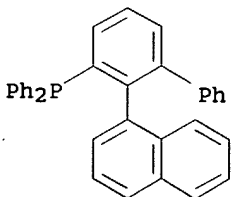
RN 181934-58-7 HCAPLUS  
 CN Phosphine oxide, [4,4'-biphenanthren]-3-ylidiphenyl-, (S)- (9CI) (CA INDEX NAME)



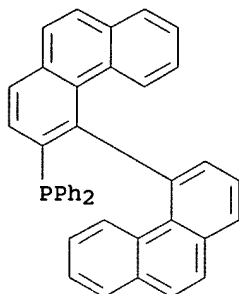
IT 156456-77-8P 170647-35-5P 181934-60-1P,  
 (S)-3-Diphenylphosphino-4,4'-biphenanthryl 181934-89-4P  
 181934-90-7P 181934-92-9P 181934-94-1P  
 RL: CAT (Catalyst use); SPN (Synthetic preparation);  
 PREP (Preparation); USES (Uses)  
 (prepn. of optically active tertiary phosphine compds. as  
 cocatalysts for prepg. optically active org. silicon compds.)  
 RN 156456-77-8 HCAPLUS  
 CN Phosphine, (1S)-[1,1'-binaphthalen]-2-ylidiphenyl- (9CI) (CA INDEX NAME)



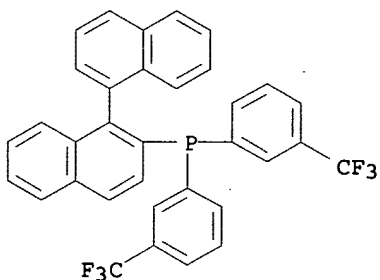
RN 170647-35-5 HCAPLUS  
 CN Phosphine, [(2S)-2-[(1S)-1-(diphenylphosphino)-1'-naphthalenyl]-1,1'-biphenyl]-3-ylidiphenyl- (9CI) (CA INDEX NAME)



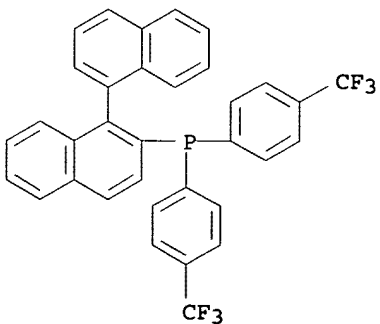
RN 181934-60-1 HCAPLUS  
CN Phosphine, [4,4'-biphenanthren]-3-ylidiphenyl-, (S)- (9CI) (CA INDEX NAME)



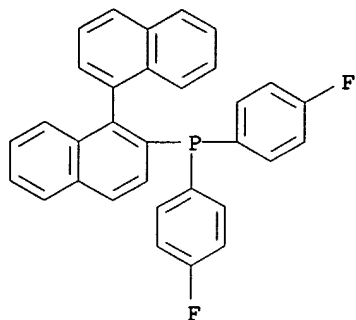
RN 181934-89-4 HCAPLUS  
CN Phosphine, [1,1'-binaphthalen]-2-ylbis[3-(trifluoromethyl)phenyl]-, (S)- (9CI) (CA INDEX NAME)



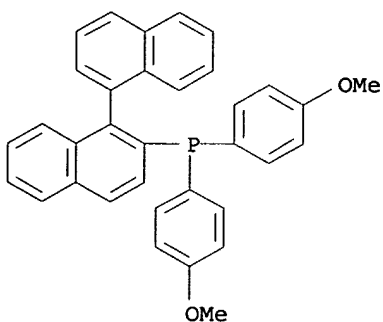
RN 181934-90-7 HCAPLUS  
CN Phosphine, [1,1'-binaphthalen]-2-ylbis[4-(trifluoromethyl)phenyl]-, (S)- (9CI) (CA INDEX NAME)



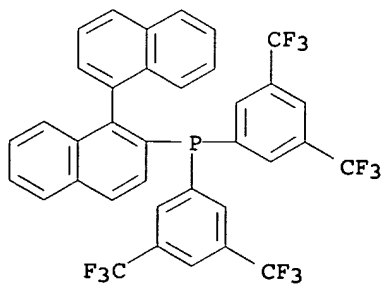
RN 181934-92-9 HCAPLUS  
CN Phosphine, [1,1'-binaphthalen]-2-ylbis(4-fluorophenyl)-, (S)- (9CI) (CA INDEX NAME)



RN 181934-94-1 HCAPLUS  
 CN Phosphine, [1,1'-binaphthalen]-2-ylbis(4-methoxyphenyl)-, (S)- (9CI)  
 (CA INDEX NAME)



IT 181934-84-9P  
 RL: RCT (Reactant); SPN (Synthetic preparation); **PREP**  
 (**Preparation**); RACT (Reactant or reagent)  
 (prepn. of optically active tertiary phosphine compds. as  
 cocatalysts for prepg. optically active org. silicon compds.)  
 RN 181934-84-9 HCAPLUS  
 CN Phosphine, [1,1'-binaphthalen]-2-ylbis[3,5-  
 bis(trifluoromethyl)phenyl]-, (S)- (9CI) (CA INDEX NAME)



IC ICM C07F009-50  
 ICS B01J031-28; C07F015-00; C07F007-12  
 ICI C07M007-00  
 CC 29-7 (Organometallic and Organometalloidal Compounds)  
 Section cross-reference(s): 25, 67  
 IT 85719-57-9  
 RL: **CAT** (Catalyst use); USES (Uses)

(Grignard phenylation of naphthylbis(trifluoromethanesulfonyloxy) benzene with phenylmagnesium bromide catalyzed by)

IT 7688-25-7, 1,4-Bis(diphenylphosphino)butane  
 RL: CAT (Catalyst use); USES (Uses)  
 (palladium-catalyzed phosphinylation of naphthylbis(trifluoromethanesulfonyloxy)benzene with diphenylphosphine oxide in presence of)

IT 170647-33-3P 181934-58-7P, (S)-3-Diphenylphosphinyl-4,4'-biphenanthryl  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
 (prepn. and deoxygenation of)

IT 12012-95-2, Allylpalladium chloride dimer 145964-33-6  
 RL: CAT (Catalyst use); USES (Uses)  
 (prepn. of optically active tertiary phosphine compds. as cocatalysts for prepg. optically active org. silicon compds.)

IT 156456-77-8P 170647-35-5P 181934-60-1P, (S)-3-Diphenylphosphino-4,4'-biphenanthryl 181934-89-4P 181934-90-7P 181934-92-9P 181934-94-1P  
 RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
 (prepn. of optically active tertiary phosphine compds. as cocatalysts for prepg. optically active org. silicon compds.)

IT 181934-84-9P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
 (prepn. of optically active tertiary phosphine compds. as cocatalysts for prepg. optically active org. silicon compds.)

L26 ANSWER 58 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1996:169300 HCAPLUS

DOCUMENT NUMBER: 124:343650

TITLE: Optically active tertiary phosphines, their metal complexes, and preparation of optically active organosilicon compounds

INVENTOR(S): Iwakura, Kazunori; Minamii, Masayoshi

PATENT ASSIGNEE(S): Sumitomo Chemical Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 07330786	A2	19951219	JP 1994-127786	19940609

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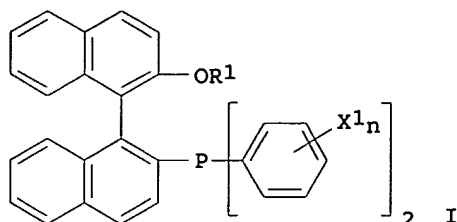
PRIORITY APPLN. INFO.: JP 1994-127786

19940609

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OTHER SOURCE(S): CASREACT 124:343650; MARPAT 124:343650

GI



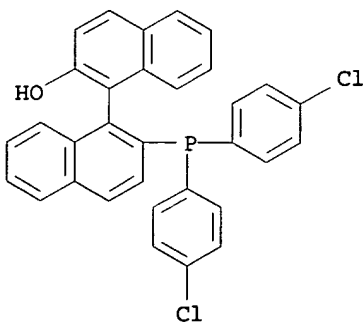
AB The tertiary phosphines I (R1 = H, lower alkyl which may be substituted with halo, lower alkoxy, Ph; X1 = halo; n = 1-5) and transition metal complexes having I as the ligands are claimed. Also claimed is a method for the prepn. of optically active R2R3CHCR4R5SiX2X3X4 (R2-5 = alkyl, alkenyl, alkynyl, cycloalkyl, aryl, aralkyl, alkoxy, H; 2 of them may be linked each other to form a ring; X2-4 = H, alkyl, alkoxy, halo), useful as synthetic intermediates, by treatment of R2R3C:CR4R5 with X2X3X4SiH in the presence of transition metal complexes having I as the ligands.

(4-ClC6H4)2P(O)H (prepn. given) was treated with (R)-2,2'-bis(trifluoromethanesulfonyloxy)-1,1'-binaphthyl (prepn. given) to give (R)-2-trifluoromethanesulfonyloxy-2'-bis(4-chlorophenyl)phosphinoyl-1,1'-binaphthyl, which was hydrolyzed followed by O-methylation and redn. to give (R)-I (R1 = Me, X1 = 4-Cl) (II). A toluene soln. of allylpalladium chloride dimer and II was treated with norbornene and SiHCl3 under stirring for 12 h to give 97% (1S,2S,4R)-2-trichlorosilylnorbornane with 95% e.e., vs. 95 and 89% e.e. for a control prep. using (R)-(+)-2-diphenylphosphino-2'-methoxy-1,1'-binaphthyl as a ligand.

IT 176370-78-8P, (R)-2-Hydroxy-2'-[bis(4-chlorophenyl)phosphino]-1,1'-binaphthyl  
 RL: CAT (Catalyst use); SPN (Synthetic preparation);  
 PREP (Preparation); USES (Uses)  
 ([bis(halophenyl)phosphino]binaphthyl transition metal complexes as asym. hydrosilylation catalysts)

RN 176370-78-8 HCAPLUS

CN [1,1'-Binaphthalen]-2-ol, 2'-[bis(4-chlorophenyl)phosphino]-, (R)-  
 (9CI) (CA INDEX NAME)

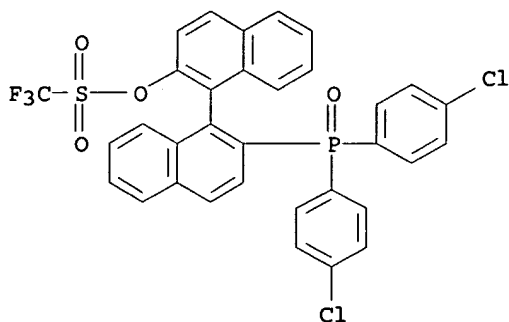


IT 176370-75-5P, (R)-2-(Trifluoromethanesulfonyloxy)-2'-[bis(4-chlorophenyl)phosphinoyl]-1,1'-binaphthyl 176370-76-6P,  
 (R)-2-Hydroxy-2'-[bis(4-chlorophenyl)phosphinoyl]-1,1'-binaphthyl  
 176370-77-7P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP  
 (Preparation); RACT (Reactant or reagent)

((bis(halophenyl)phosphino)binaphthyl transition metal complexes  
as asym. hydrosilylation catalysts)

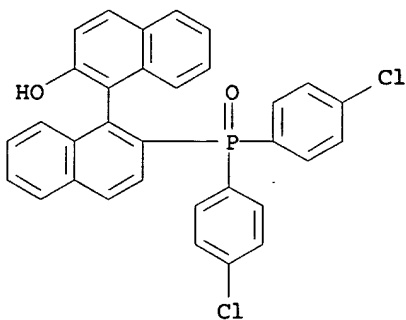
RN 176370-75-5 HCAPLUS

CN Methanesulfonic acid, trifluoro-, 2'-[bis(4-chlorophenyl)phosphinyl][1,1'-binaphthalen]-2-yl ester, (R)- (9CI)  
(CA INDEX NAME)



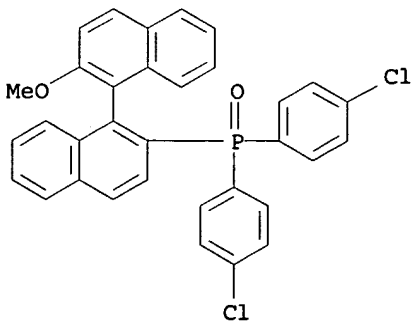
RN 176370-76-6 HCAPLUS

CN [1,1'-Binaphthalen]-2-ol, 2'-[bis(4-chlorophenyl)phosphinyl]-, (R)- (9CI) (CA INDEX NAME)



RN 176370-77-7 HCAPLUS

CN Phosphine oxide, bis(4-chlorophenyl) (2'-methoxy[1,1'-binaphthalen]-2-yl)-, (R)- (9CI) (CA INDEX NAME)



IT 165730-08-5P, (R)-2-Methoxy-2'-[bis(4-chlorophenyl)phosphino]-1,1'-binaphthyl  
RL: CAT (Catalyst use); SPN (Synthetic preparation);

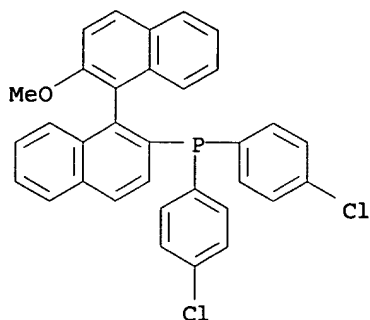


**PREP (Preparation); USES (Uses)**

(catalysts contg. allylpalladium chloride dimer;  
[bis(halophenyl)phosphino]binaphthyl transition metal complexes  
as asym. hydrosilylation catalysts)

RN 165730-08-5 HCAPLUS

CN Phosphine, bis(4-chlorophenyl) (2'-methoxy[1,1'-binaphthalen]-2-yl)-,  
(R)- (9CI) (CA INDEX NAME)



IC ICM C07F009-50

ICS B01J031-18; C07F007-14; C07F007-18

ICA C07B061-00

ICI C07M007-00

CC 29-6 (Organometallic and Organometalloidal Compounds)

Section cross-reference(s): 67

IT 176370-78-8P, (R)-2-Hydroxy-2'-[bis(4-chlorophenyl)phosphino]-1,1'-binaphthyl

RL: CAT (Catalyst use); SPN (Synthetic preparation);

**PREP (Preparation); USES (Uses)**

([bis(halophenyl)phosphino]binaphthyl transition metal complexes  
as asym. hydrosilylation catalysts)

IT 15948-60-4P, Bis(4-chlorophenyl)phosphine oxide 126613-06-7P,

(R)-2,2'-Bis(trifluoromethanesulfonyloxy)-1,1'-binaphthyl

176370-75-5P, (R)-2-(Trifluoromethanesulfonyloxy)-2'-[bis(4-

chlorophenyl)phosphino]-1,1'-binaphthyl 176370-76-6P,

(R)-2-Hydroxy-2'-[bis(4-chlorophenyl)phosphino]-1,1'-binaphthyl

176370-77-7P

RL: RCT (Reactant); SPN (Synthetic preparation); **PREP****(Preparation); RACT (Reactant or reagent)**

([bis(halophenyl)phosphino]binaphthyl transition metal complexes  
as asym. hydrosilylation catalysts)

IT 12012-95-2, Allylpalladium chloride dimer

RL: CAT (Catalyst use); USES (Uses)

(catalysts contg. (R)-2-methoxy-2'-[bis(4-chlorophenyl)phosphino]-  
1,1'-binaphthyl; asym. hydrosilylation catalyst)

IT 165730-08-5P, (R)-2-Methoxy-2'-[bis(4-chlorophenyl)phosphino]-1,1'-binaphthyl

RL: CAT (Catalyst use); SPN (Synthetic preparation);

**PREP (Preparation); USES (Uses)**

(catalysts contg. allylpalladium chloride dimer;  
[bis(halophenyl)phosphino]binaphthyl transition metal complexes  
as asym. hydrosilylation catalysts)

L26 ANSWER 59 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1995:716774 HCAPLUS

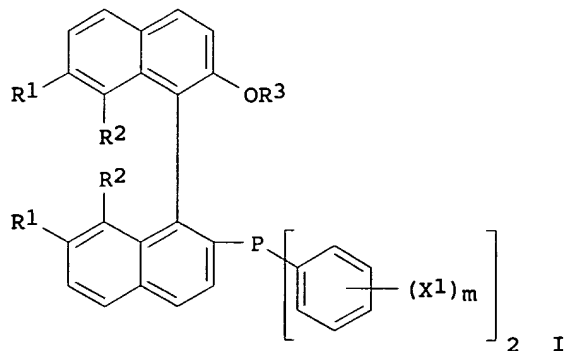
DOCUMENT NUMBER: 123:144274

TITLE: Preparation of tertiary phosphines and their  
transition metal complexes as catalysts for  
asymmetric synthesis reactions

INVENTOR(S): Hayashi, Tamio; Uozumi, Yasuhiro; Iwakura,  
Kazunori; Kurimoto, Isao; Minai, Masayoshi

PATENT ASSIGNEE(S): Sumitomo Chemical Co., Ltd., Japan  
 SOURCE: Eur. Pat. Appl., 21 pp.  
 CODEN: EPXXDW  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 647647	A1	19950412	EP 1994-111780	19940728
EP 647647	B1	20011024	<--	
R: CH, DE, FR, GB, LI				
JP 07149776	A2	19950613	JP 1994-15341	19940209
JP 3590980	B2	20041117	<--	
JP 07224073	A2	19950822	JP 1994-16760	19940210
JP 3489176	B2	20040119	<--	
US 5523437	A	19960604	US 1994-280814	19940726
PRIORITY APPLN. INFO.:			JP 1993-251635	A 19931007
			JP 1994-15341	A 19940209
			JP 1994-16760	A 19940210
OTHER SOURCE(S):			<--	
GI			CASREACT 123:144274; MARPAT 123:144274	



AB The prepn. of tertiary phosphine compd. I (R1, R2 = independently from each other a H, Me; R1R2 = CH:CHCH:CH; R3 =

H, C5-7 cycloalkyl, lower alkyl group which may be substituted with halogen, lower alkoxy, lower alkoxyalkoxy, Ph; X1 = halogen atom when both R1 and R2 are hydrogens, hydrogen atom, halogen atom, lower alkyl group, lower alkoxy group when at least one of R1 and R2 is not a hydrogen atoms; m = 1-5), useful as ligand of a transition metal complex that can catalyze various reactions, is described. Thus, redn. of (R)-(+)-3-diphenylphosphinyl-3'-methoxy-4,4'-biphenanthryl (prepn. given) with  $\text{HSiCl}_3$  in the presence of Et3N gave title compd., (R)-(+)-3-diphenylphosphino-3'-methoxy-4,4'-biphenanthryl (II), which was used in asym. synthesis of  $\alpha$ -olefins. Thus, tris(dibenzylideneacetone)(chloroform)dipalladium(0)-catalyzed reaction of geranylmethyl carbonate with formic acid in the presence of 1,8-bis(dimethylamino)naphthalene and chiral cocatalyst II gave (S)-3,7-dimethyl-1,6-octadiene.

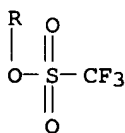
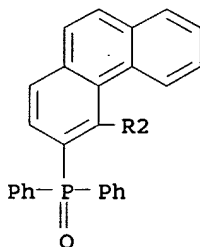
IT 157397-73-4P 165730-04-1P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent) (prepn. and hydrolysis of)

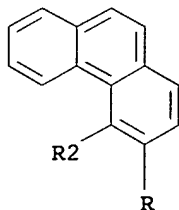
RN 157397-73-4 HCAPLUS

CN Methanesulfonic acid, trifluoro-, 3'-(diphenylphosphinyl)[4,4'-biphenanthren]-3-yl ester, (R)- (9CI) (CA INDEX NAME)

PAGE 1-A

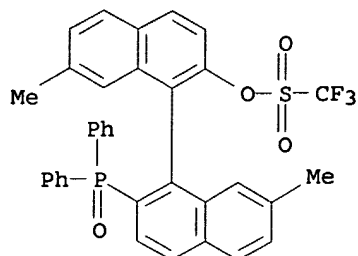


PAGE 2-A



RN 165730-04-1 HCAPLUS

CN Methanesulfonic acid, trifluoro-, 2'-(diphenylphosphinyl)-7,7'-dimethyl[1,1'-binaphthalen]-2-yl ester, (R)- (9CI) (CA INDEX NAME)

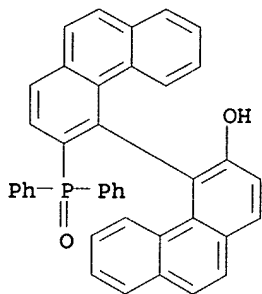


IT 157397-74-5P 165730-05-2P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent) (prepn. and methylation of)

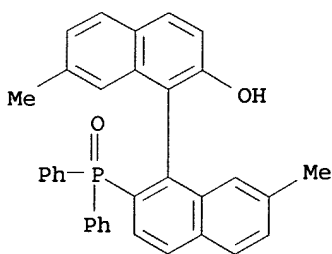
RN 157397-74-5 HCAPLUS

CN [4,4'-Biphenanthren]-3-ol, 3'-(diphenylphosphinyl)-, (R)- (9CI) (CA INDEX NAME)



RN 165730-05-2 HCAPLUS

CN [1,1'-Binaphthalen]-2-ol, 2'-(diphenylphosphinyl)-7,7'-dimethyl-, (R)- (9CI) (CA INDEX NAME)

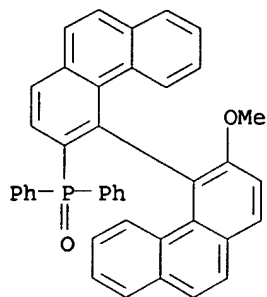


IT 157397-75-6P 165730-06-3P

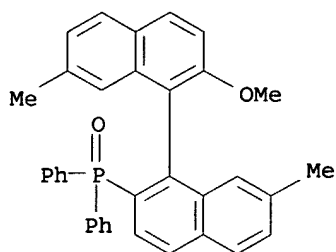
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent) (prepn. and redn. of)

RN 157397-75-6 HCAPLUS

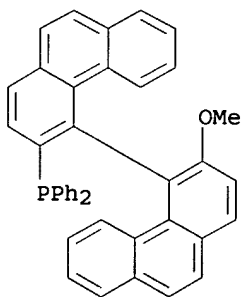
CN Phosphine oxide, (3'-methoxy[4,4'-biphenanthren]-3-yl)diphenyl-, (R)- (9CI) (CA INDEX NAME)



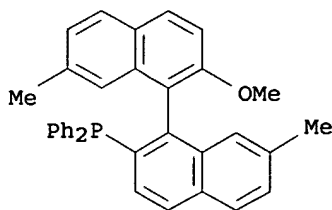
RN 165730-06-3 HCAPLUS  
 CN Phosphine oxide, (2'-methoxy-7,7'-dimethyl[1,1'-binaphthalen]-2-yl)diphenyl-, (R)- (9CI) (CA INDEX NAME)



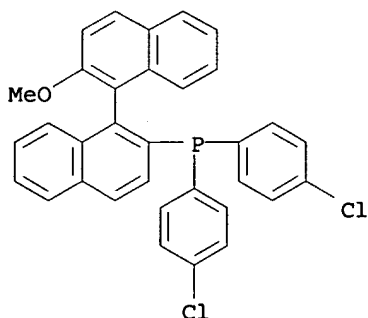
IT 155184-93-3P 165730-07-4P 165730-08-5P  
 RL: CAT (Catalyst use); SPN (Synthetic preparation);  
 PREP (Preparation); USES (Uses)  
 (prepn. of tertiary phosphines and their transition metal  
 complexes as catalysts for asym. synthesis reactions)  
 RN 155184-93-3 HCAPLUS  
 CN Phosphine, [(4R)-3'-methoxy[4,4'-biphenanthren]-3-yl]diphenyl- (9CI)  
 (CA INDEX NAME)



RN 165730-07-4 HCAPLUS  
 CN Phosphine, (2'-methoxy-7,7'-dimethyl[1,1'-binaphthalen]-2-yl)diphenyl-, (R)- (9CI) (CA INDEX NAME)



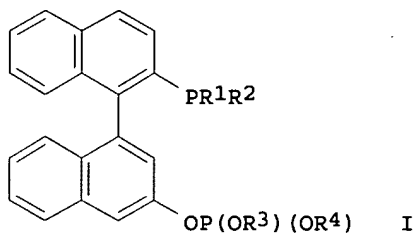
RN 165730-08-5 HCAPLUS  
 CN Phosphine, bis(4-chlorophenyl) (2'-methoxy[1,1'-binaphthalen]-2-yl)-,  
 (R)- (9CI) (CA INDEX NAME)



IC ICM C07F009-50  
 ICS B01J031-28; C07F015-00; C07F007-08; C07F007-14; C07F007-18;  
 C07C001-22  
 ICI C07M005-00, C07M007-00  
 CC 29-7 (Organometallic and Organometalloidal Compounds)  
 Section cross-reference(s): 21  
 IT 157397-73-4P 165730-04-1P  
 RL: RCT (Reactant); SPN (Synthetic preparation); **PREP**  
 (**Preparation**); RACT (Reactant or reagent)  
 (prepn. and hydrolysis of)  
 IT 157397-74-5P 165730-05-2P  
 RL: RCT (Reactant); SPN (Synthetic preparation); **PREP**  
 (**Preparation**); RACT (Reactant or reagent)  
 (prepn. and methylation of)  
 IT 157397-75-6P 165730-06-3P  
 RL: RCT (Reactant); SPN (Synthetic preparation); **PREP**  
 (**Preparation**); RACT (Reactant or reagent)  
 (prepn. and redn. of)  
 IT 6737-42-4 12012-95-2 51364-51-3  
 RL: **CAT** (**Catalyst use**); **USES** (**Uses**)  
 (prepn. of tertiary phosphines and their transition metal  
 complexes as catalysts for asym. synthesis reactions)  
 IT 155184-93-3P 165730-07-4P 165730-08-5P  
 RL: **CAT** (**Catalyst use**); SPN (Synthetic preparation);  
**PREP** (**Preparation**); **USES** (**Uses**)  
 (prepn. of tertiary phosphines and their transition metal  
 complexes as catalysts for asym. synthesis reactions)  
 L26 ANSWER 60 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 1995:231203 HCAPLUS  
 DOCUMENT NUMBER: 122:10257  
 TITLE: preparation of phosphine compounds and their  
 transition metal complexes  
 INVENTOR(S): Takaya, Hidemasa; Sakai, Nozomu; Tamao, Kyoko  
 Beru Mezon; Mano, Satoshi; Kumobayashi, Hidenor;

PATENT ASSIGNEE(S): Tomita, Tetsu  
 Mitsubishi Gas Chemical Company, Inc., Japan;  
 Takasago International Corporation  
 SOURCE: Eur. Pat. Appl., 12 pp.  
 CODEN: EPXXDW  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 5  
 PATENT INFORMATION:

PATENT NO. -----	KIND ----	DATE -----	APPLICATION NO. -----	DATE
EP 614901	A1	19940914	EP 1994-103674	199403 10
EP 614901	B1	19980812	<--	
R: CH, DE, FR, GB, IT, LI, NL				
JP 06263776	A2	19940920	JP 1993-52538	199303 12
JP 3313805	B2	20020812	<--	
PRIORITY APPLN. INFO.:			JP 1993-52538	A 199303 12
OTHER SOURCE(S):			<--	
GI			CASREACT 122:10257; MARPAT 122:10257	



AB Disclosed herein is the prepn. of phosphine compd. I (R1, R2 = same or different halo or lower alkyl group substituted Ph, divalent hydrocarbon group; R3, R4 = same or different alkyl, halo or lower alkyl group substituted Ph, divalent hydrocarbon group), and their transition metal-phosphine complexes. When the transition metal-phosphine complex is used as a catalyst for asym. synthesis, an intended product having a desired abs. configuration can be obtained in a high optical purity at a high yield. Thus, reaction of (R)-2-diphenylphosphino-2'-hydroxy-1,1'-binaphthyl (prepn. given) with (S)-1,1'-binaphthalene-2,2'-diyldioxychlorophosphine (prepn. given) in the presence of Et3N in Et2O gave 98% title phosphine, (R)-2-diphenylphosphino-1,1'-binaphthalene-2'-yloxy((S)-1,1'-binaphthalene-2,2'-diyldioxy)phosphine, which was reacted with [Rh(CO)2(acac)] to give asym. hydroformylation catalyst for vinyl acetate or styrene.

IT 159398-08-0P 159398-09-1P 159398-10-4P  
 159516-56-0P

RL: CAT (Catalyst use); SPN (Synthetic preparation);

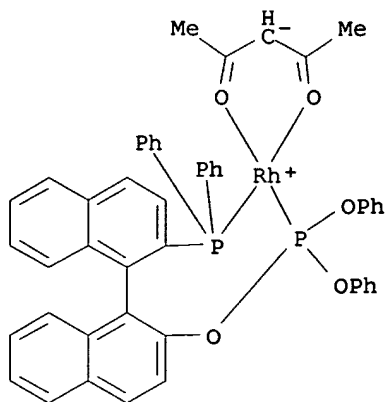
PREP (Preparation); USES (Uses)

(prepn. of phosphine compds. and their transition metal

complexes)

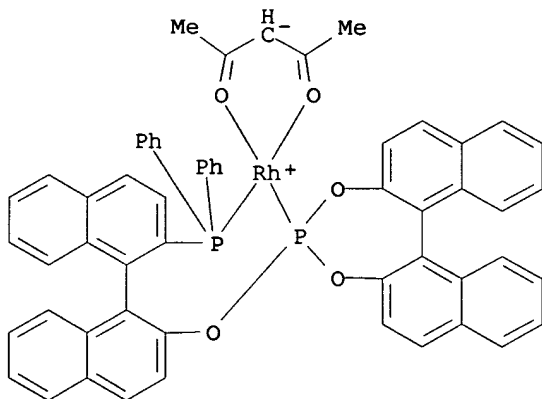
RN 159398-08-0 HCAPLUS

CN Rhodium, [2'-(diphenylphosphino)[1,1'-binaphthalen]-2-yl diphenyl phosphite-P,P'] (2,4-pentanedionato-O,O')-, [SP-4-3-(R)]- (9CI) (CA INDEX NAME)



RN 159398-09-1 HCAPLUS

CN Rhodium, [4-[[2'-(diphenylphosphino-κP)[1,1'-binaphthalen]-2-yl]oxy]dinaphtho[2,1-d:1',2'-f][1,3,2]dioxaphosphepin-κP4] (2,4-pentanedionato-κO,κO')-, stereoisomer (9CI) (CA INDEX NAME)

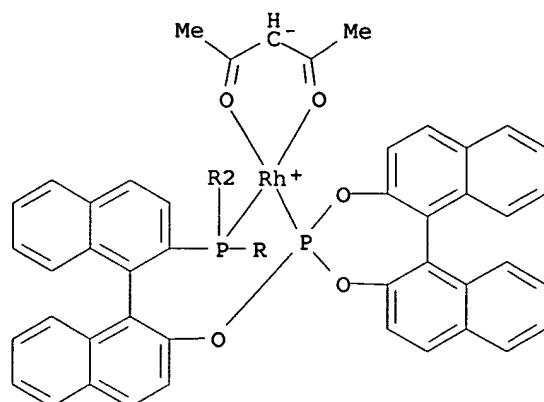


RN 159398-10-4 HCAPLUS

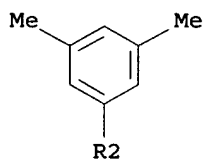
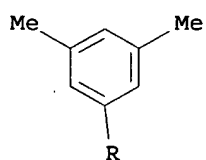
CN Rhodium, [4-[[2'-[bis(3,5-dimethylphenyl)phosphino-κP][1,1'-binaphthalen]-2-yl]oxy]dinaphtho[2,1-d:1',2'-f][1,3,2]dioxaphosphepin-κP4] (2,4-pentanedionato-κO,κO')-, stereoisomer (9CI) (CA INDEX NAME)



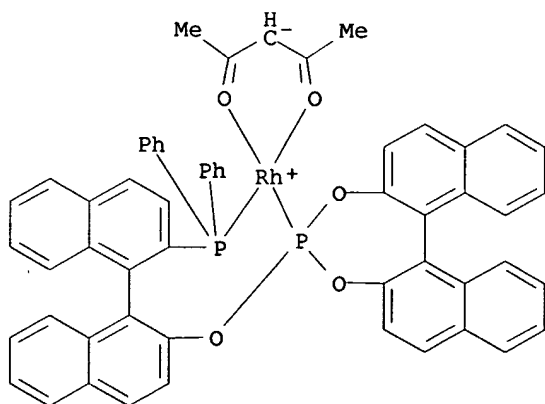
PAGE 1-A



PAGE 2-A



RN 159516-56-0 HCAPLUS  
 CN Rhodium, [4-[[2'-(diphenylphosphino-κP) [1,1'-binaphthalen]-2-yl]oxy]dinaphtho[2,1-d:1',2'-f] [1,3,2]dioxaphosphepin-κP4] (2,4-pentanedionato-κO,κO')-, stereoisomer (9CI) (CA INDEX NAME)

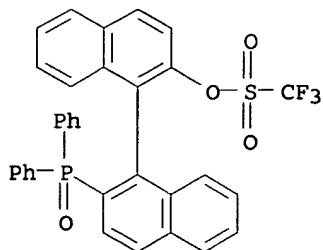


IT 132532-04-8P 149917-85-1P 149917-86-2P  
149917-87-3P 149917-88-4P 149917-89-5P  
149952-92-1P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP  
(Preparation); RACT (Reactant or reagent)  
(prepn. of phosphine compds. and their transition metal  
complexes)

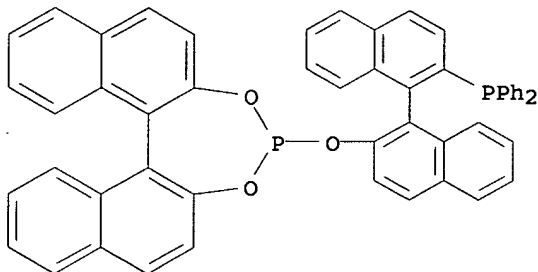
RN 132532-04-8 HCAPLUS

CN Methanesulfonic acid, trifluoro-, (1R)-2'-(diphenylphosphinyl)[1,1'-  
binaphthalen]-2-yl ester (9CI) (CA INDEX NAME)



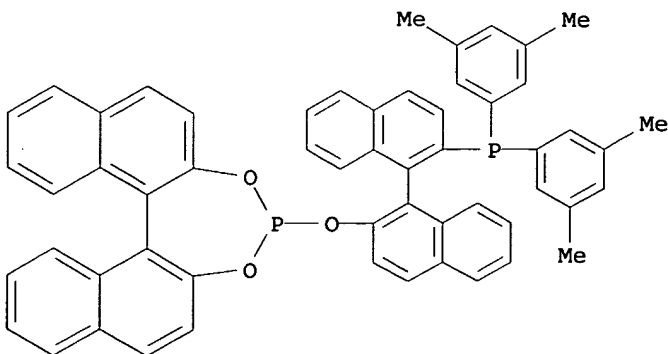
RN 149917-85-1 HCAPLUS

CN Dinaphtho[2,1-d:1',2'-f][1,3,2]dioxaphosphepin, 4-[[{(1R)-2'-  
(diphenylphosphino)[1,1'-binaphthalen]-2-yl]oxy]-, (1bS)- (9CI)  
(CA INDEX NAME)



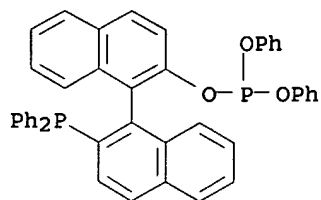
RN 149917-86-2 HCAPLUS

CN Dinaphtho[2,1-d:1',2'-f][1,3,2]dioxaphosphepin, 4-[[2'-[bis(3,5-  
dimethylphenyl)phosphino][1,1'-binaphthalen]-2-yl]oxy]-,  
stereoisomer (9CI) (CA INDEX NAME)



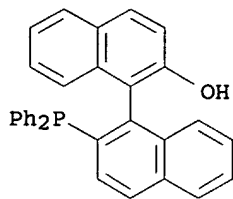
RN 149917-87-3 HCAPLUS

CN Phosphorous acid, (1R)-2'-(diphenylphosphino)[1,1'-binaphthalen]-2-yl diphenyl ester (9CI) (CA INDEX NAME)



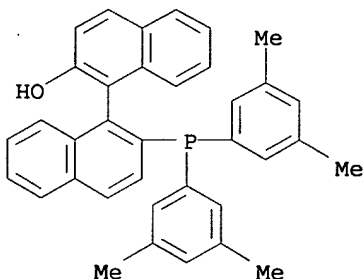
RN 149917-88-4 HCAPLUS

CN [1,1'-Binaphthalen]-2-ol, 2'-(diphenylphosphino)-, (1R)- (9CI) (CA INDEX NAME)



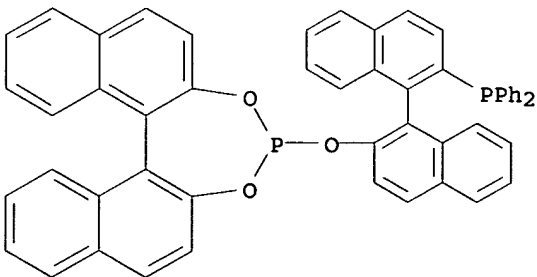
RN 149917-89-5 HCAPLUS

CN [1,1'-Binaphthalen]-2-ol, 2'-[bis(3,5-dimethylphenyl)phosphino]-, (R)- (9CI) (CA INDEX NAME)



RN 149952-92-1 HCAPLUS

CN Dinaphtho[2,1-d:1',2'-f][1,3,2]dioxaphosphepin, 4-[[{(1R)-2'-(diphenylphosphino)[1,1'-binaphthalen]-2-yl]oxy]-, (1bR)- (9CI) (CA INDEX NAME)



IC ICM C07F009-50  
 ICS C07F015-00; C07C045-50; C07F009-6574; C07F009-6568  
 CC 29-7 (Organometallic and Organometalloidal Compounds)  
 Section cross-reference(s): 67, 78  
 ST **diphosphine prepn transition**  
**metal ligand; rhodium diphosphine**  
 complex **prepn** hydroformylation catalyst  
 IT 159398-08-0P 159398-09-1P 159398-10-4P  
 159516-56-0P  
 RL: CAT (Catalyst use); SPN (Synthetic preparation);  
 PREP (Preparation); USES (Uses)  
 (prepn. of phosphine compds. and their transition metal  
 complexes)  
 IT 126613-06-7P 132532-04-8P 137156-22-0P  
 149917-85-1P 149917-86-2P 149917-87-3P  
 149917-88-4P 149917-89-5P 149952-92-1P  
 155613-52-8P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP  
 (Preparation); RACT (Reactant or reagent)  
 (prepn. of phosphine compds. and their transition metal  
 complexes)

L26 ANSWER 61 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1995:231202 HCAPLUS

DOCUMENT NUMBER: 122:31704

TITLE: Phosphine compounds and transition  
 metal-phosphine complexes containing them as  
 ligands.

INVENTOR(S): Matsumura, Kazuhiko; Saito, Takao; Sayo, Noboru;  
 Kumobayashi, Hidemasa; Takaya, Hidemasa

PATENT ASSIGNEE(S): Takasago International Corporation, Japan

SOURCE: Eur. Pat. Appl., 9 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

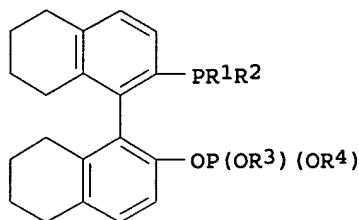
LANGUAGE: English

FAMILY ACC. NUM. COUNT: 5

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 614902	A1	19940914	EP 1994-301774	199403 11
EP 614902	B1	19970611		
R: CH, DE, FR, GB, IT, LI, NL				
JP 06263777	A2	19940920	JP 1993-52540	199303 12
PRIORITY APPLN. INFO.:			JP 1993-52540	A 199303 12

OTHER SOURCE(S): CASREACT 122:31704; MARPAT 122:31704  
 GI



I

AB Novel phosphine compds. I wherein R1 and R2, which may be the same or different, each represent a Ph group or a Ph group substituted with a halogen atom or a lower alkyl group or they are taken together to form a divalent hydrocarbon group; and R3 and R4, which may be the same or different, each represent a lower alkyl group, a Ph group or a Ph group substituted with a halogen atom, a lower alkyl group or a lower alkoxy group or they are taken together to form a divalent hydrocarbon group. were **prepd.**

Transition metal-phosphine complexes

contg. the phosphine compd. I as a ligand

catalyze asym. **synthesis** and provide a compd. having a desired abs. configuration in high yield and high asym. yield.

IT 159398-06-8P 159398-07-9P 159398-23-9P

159398-24-0P 159398-26-2P 159436-33-6P

159516-54-8P 159516-55-9P

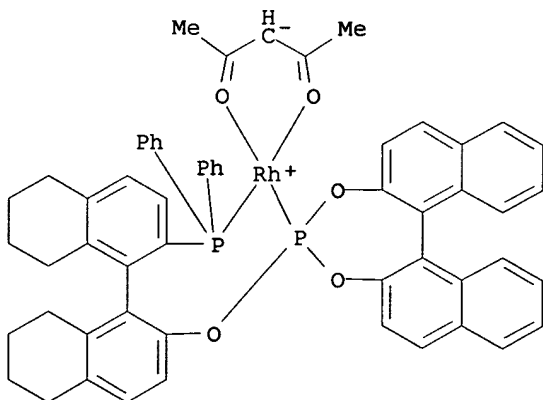
RL: CAT (Catalyst use); SPN (Synthetic preparation);

PREP (Preparation); USES (Uses)

(prepn. of chiral phosphinobinaphthyl phosphites and their metal complexes for stereoselective hydroformylation of alkenes)

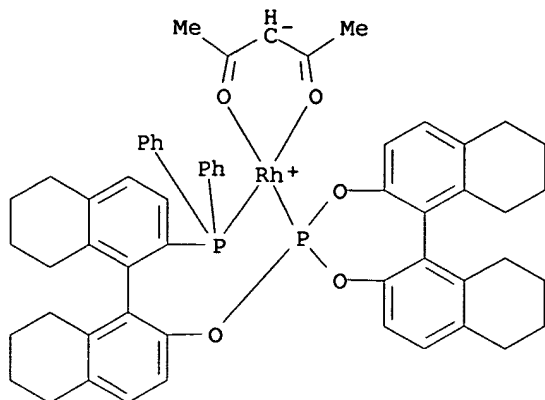
RN 159398-06-8 HCAPLUS

CN Rhodium, [4-[[2'-(diphenylphosphino)-5,5',6,6',7,7',8,8'-octahydro[1,1'-binaphthalen]-2-yl]oxy]dinaphtho[2,1-d:1',2'-f][1,3,2]dioxaphosphepin-P4,P4'] (2,4-pentanedionato-O,O')-, stereoisomer (9CI) (CA INDEX NAME)



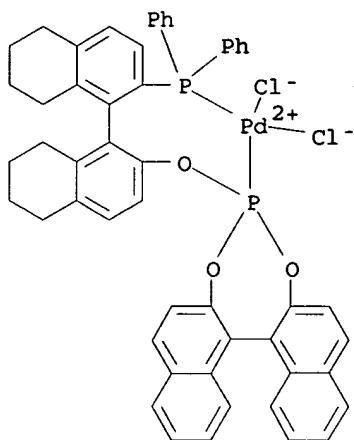
RN 159398-07-9 HCAPLUS

CN Rhodium, [4-[[2'-(diphenylphosphino)-5,5',6,6',7,7',8,8'-octahydro[1,1'-binaphthalen]-2-yl]oxy]-8,9,10,11,12,13,14,15-octahydrodinaphtho[2,1-d:1',2'-f][1,3,2]dioxaphosphepin-P4,P4'] (2,4-pentanedionato-O,O')-, stereoisomer (9CI) (CA INDEX NAME)



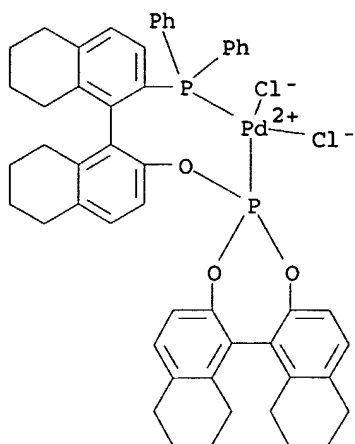
RN 159398-23-9 HCAPLUS

CN Palladium, dichloro[4-[[2'-(diphenylphosphino)-5,5',6,6',7,7',8,8'-octahydro[1,1'-binaphthalen]-2-yl]oxy]dinaphtho[2,1-d:1',2'-f][1,3,2]dioxaphosphepin-P4,P4']-, stereoisomer (9CI) (CA INDEX NAME)



RN 159398-24-0 HCAPLUS

CN Palladium, dichloro[4-[[2'-(diphenylphosphino)-5,5',6,6',7,7',8,8'-octahydro[1,1'-binaphthalen]-2-yl]oxy]-8,9,10,11,12,13,14,15-octahydrodinaphtho[2,1-d:1',2'-f][1,3,2]dioxaphosphepin-P4,P4']-, stereoisomer (9CI) (CA INDEX NAME)

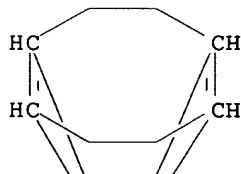


RN 159398-26-2 HCAPLUS  
 CN Iridium(1+), [(1,2,5,6-η)-1,5-cyclooctadiene][4-[[2'-(diphenylphosphino)-5,5',6,6',7,7',8,8'-octahydro[1,1'-binaphthalen]-2-yl]oxy]dinaphtho[2,1-d:1',2'-f][1,3,2]dioxaphosphepin-P4,P4']-, stereoisomer, tetrafluoroborate(1-) (9CI) (CA INDEX NAME)

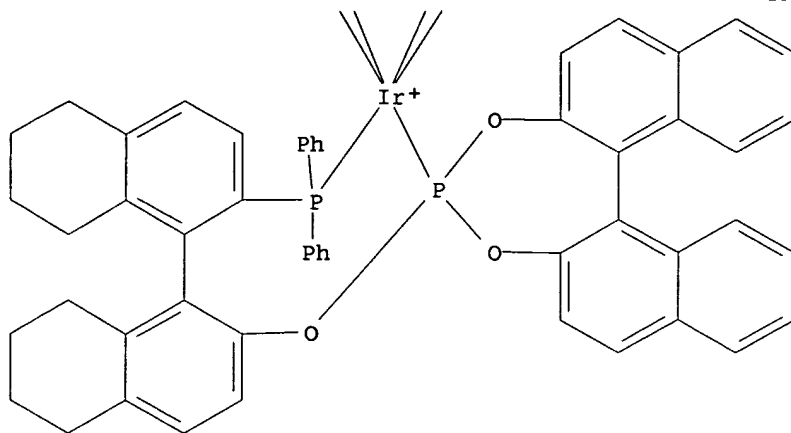
CM 1

CRN 159398-25-1  
 CMF C60 H54 Ir O3 P2  
 CCI CCS

PAGE 1-A



PAGE 2-A

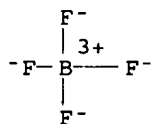


CM 2

CRN 14874-70-5

CMF B F4

CCI CCS



RN 159436-33-6 HCAPLUS

CN Iridium(1+), [(1,2,5,6-η)-1,5-cyclooctadiene] [4-[[2'-(diphenylphosphino)-5,5',6,6',7,7',8,8'-octahydro[1,1'-binaphthalen]-2-yl]oxy]dinaphtho[2,1-d:1',2'-f][1,3,2]dioxaphosphepin-P4,P4']-, stereoisomer, tetrafluoroborate(1-) (9CI) (CA INDEX NAME)

CM 1

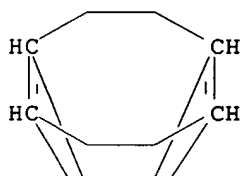
CRN 159436-32-5

CMF C60 H62 Ir O3 P2

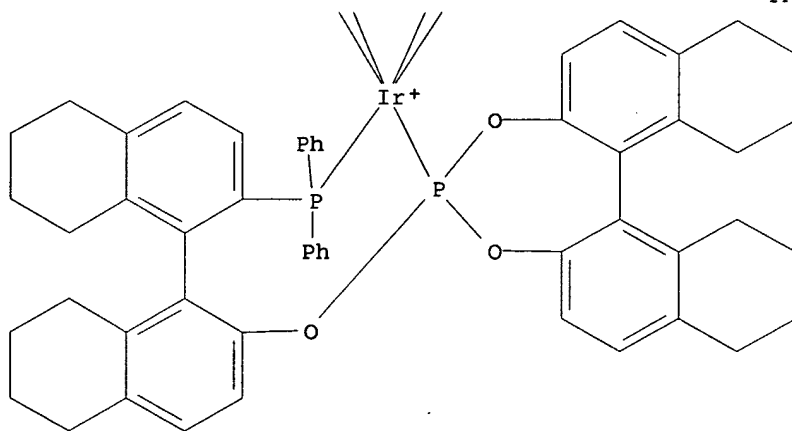
CCI CCS



PAGE 1-A



PAGE 2-A

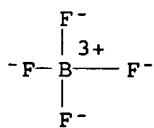


CM 2

CRN 14874-70-5

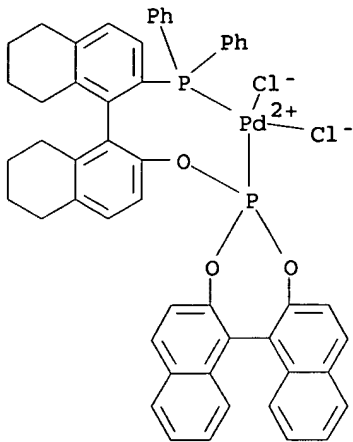
CMF B F4

CCI CCS



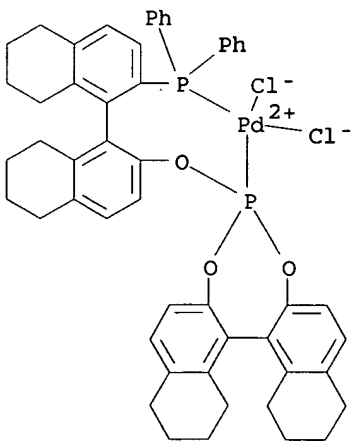
RN 159516-54-8 HCAPLUS

CN Palladium, dichloro[4-[[2'-(diphenylphosphino)-5,5',6,6',7,7',8,8'-octahydro[1,1'-binaphthalen]-2-yl]oxy]dinaphtho[2,1-d:1',2'-f][1,3,2]dioxaphosphepin-P4,P4']-, stereoisomer (9CI) (CA INDEX NAME)



RN 159516-55-9 HCAPLUS

CN Palladium, dichloro[4-[[2'-(diphenylphosphino)-5,5',6,6',7,7',8,8'-octahydro[1,1'-binaphthalen]-2-yl]oxy]-8,8,9,11,12,13,14,15-octahydrodinaphtho[2,1-d:1',2'-f][1,3,2]dioxaphosphepin-P4,P4']-, stereoisomer (9CI) (CA INDEX NAME)



IT 159496-90-9P 159496-91-0P 159496-92-1P

159496-94-3P 159573-31-6P 159573-32-7P

159573-33-8P 159573-34-9P

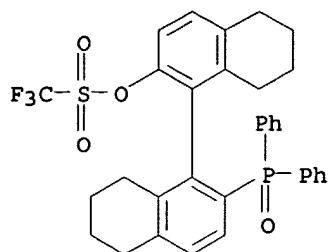
RL: RCT (Reactant); SPN (Synthetic preparation); PREP

(Preparation); RACT (Reactant or reagent)

(prepn. of chiral phosphinobinaphthyl phosphites and their metal complexes for stereoselective hydroformylation of alkenes)

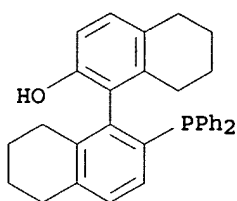
RN 159496-90-9 HCAPLUS

CN Methanesulfonic acid, trifluoro-, (1R)-2'-(diphenylphosphinyl)-5,5',6,6',7,7',8,8'-octahydro[1,1'-binaphthalen]-2-yl ester (9CI) (CA INDEX NAME)



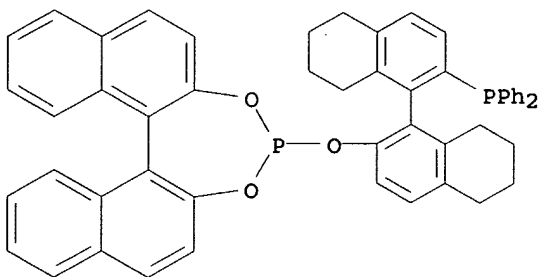
RN 159496-91-0 HCAPLUS

CN [1,1'-Binaphthalen]-2-ol, 2'-(diphenylphosphino)-5,5',6,6',7,7',8,8'-octahydro-, (R)- (9CI) (CA INDEX NAME)



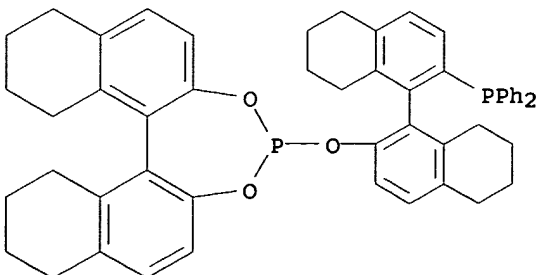
RN 159496-92-1 HCAPLUS

CN Dinaphtho[2,1-d:1',2'-f][1,3,2]dioxaphosphepin, 4-[[2'-(diphenylphosphino)-5,5',6,6',7,7',8,8'-octahydro[1,1'-binaphthalen]-2-yl]oxy]-, stereoisomer (9CI) (CA INDEX NAME)

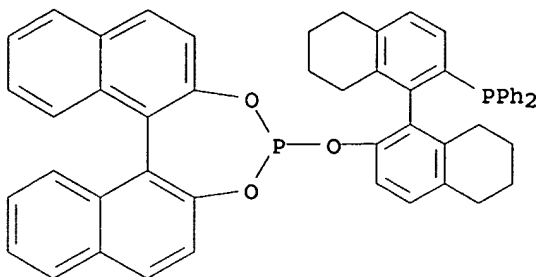


RN 159496-94-3 HCAPLUS

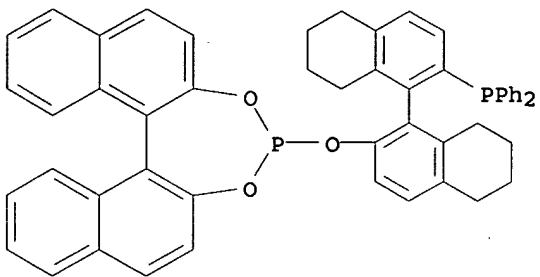
CN Dinaphtho[2,1-d:1',2'-f][1,3,2]dioxaphosphepin, 4-[[2'-(diphenylphosphino)-5,5',6,6',7,7',8,8'-octahydro[1,1'-binaphthalen]-2-yl]oxy]-8,9,10,11,12,13,14,15-octahydro-, stereoisomer (9CI) (CA INDEX NAME)



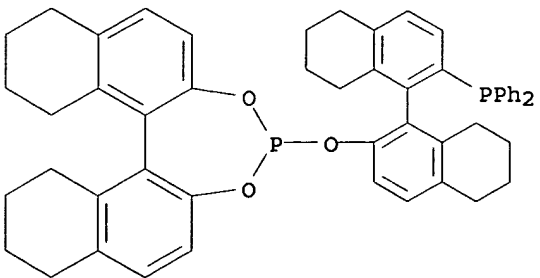
RN 159573-31-6 HCAPLUS  
 CN Dinaphtho[2,1-d:1',2'-f][1,3,2]dioxaphosphepin, 4-[[2'-(diphenylphosphino)-5,5',6,6',7,7',8,8'-octahydro[1,1'-binaphthalen]-2-yl]oxy]-, stereoisomer (9CI) (CA INDEX NAME)



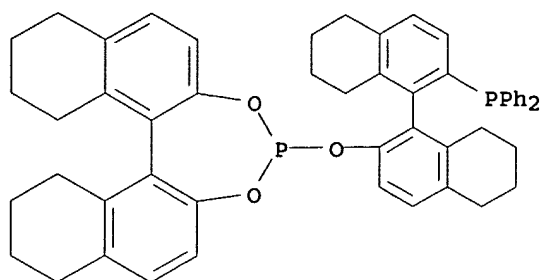
RN 159573-32-7 HCAPLUS  
 CN Dinaphtho[2,1-d:1',2'-f][1,3,2]dioxaphosphepin, 4-[[2'-(diphenylphosphino)-5,5',6,6',7,7',8,8'-octahydro[1,1'-binaphthalen]-2-yl]oxy]-, stereoisomer (9CI) (CA INDEX NAME)



RN 159573-33-8 HCAPLUS  
 CN Dinaphtho[2,1-d:1',2'-f][1,3,2]dioxaphosphepin, 4-[[2'-(diphenylphosphino)-5,5',6,6',7,7',8,8'-octahydro[1,1'-binaphthalen]-2-yl]oxy]-8,9,10,11,12,13,14,15-octahydro-, stereoisomer (9CI) (CA INDEX NAME)



RN 159573-34-9 HCAPLUS  
 CN Dinaphtho[2,1-d:1',2'-f][1,3,2]dioxaphosphepin, 4-[[2'-(diphenylphosphino)-5,5',6,6',7,7',8,8'-octahydro[1,1'-binaphthalen]-2-yl]oxy]-8,9,10,11,12,13,14,15-octahydro-, stereoisomer (9CI) (CA INDEX NAME)



IC ICM C07F009-50  
ICS C07F015-00  
CC 29-7 (Organometallic and Organometalloidal Compounds)  
Section cross-reference(s): 78  
IT 159398-06-8P 159398-07-9P 159398-23-9P  
159398-24-0P 159398-26-2P 159436-33-6P  
159516-54-8P 159516-55-9P  
RL: CAT (Catalyst use); SPN (Synthetic preparation);  
PREP (Preparation); USES (Uses)  
(prepn. of chiral phosphinobinaphthyl phosphites and their metal  
complexes for stereoselective hydroformylation of alkenes)  
IT 65355-14-8P 137156-22-0P 159496-89-6P 159496-90-9P  
159496-91-0P 159496-92-1P 159496-93-2P  
159496-94-3P 159573-31-6P 159573-32-7P  
159573-33-8P 159573-34-9P  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP  
(Preparation); RACT (Reactant or reagent)  
(prepn. of chiral phosphinobinaphthyl phosphites and their metal  
complexes for stereoselective hydroformylation of alkenes)

L26 ANSWER 62 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 1995:231201 HCAPLUS  
DOCUMENT NUMBER: 122:239952  
TITLE: Preparation of diphosphines and rhodium  
complexes and their use for producing optically  
active aldehydes and 4-[(R)-1'-  
formylethyl]azetidin-2-one derivatives.  
INVENTOR(S): Saito, Takao; Matsumura, Kazuhiko; Kato,  
Yasushi; Sayo, Noboru; Kumobayashi, Hidenori  
PATENT ASSIGNEE(S): Takasago International Corporation, Japan  
SOURCE: Eur. Pat. Appl., 31 pp.  
CODEN: EPXXDW  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 5  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 614903	A2	19940914	EP 1994-301775	199403 11
EP 614903	A3	19950111		
EP 614903	B1	20000920		
R: CH, DE, FR, GB, IT, LI, NL				
JP 06316560	A2	19941115	JP 1994-54426	199403 01
JP 3277065	B2	20020422		
JP 2002128759	A2	20020509	JP 2001-328632	

199403  
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EP 684249 A1 19951129 EP 1995-111575

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EP 684249 B1 20030219  
R: CH, DE, FR, GB, IT, LI, NL

EP 684230 A1 19951129 EP 1995-111576

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PRIORITY APPLN. INFO.: JP 1993-77484 A

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JP 1994-54426 A3

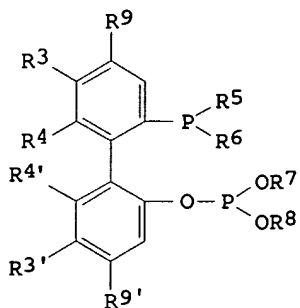
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OTHER SOURCE(S): CASREACT 122:239952; MARPAT 122:239952

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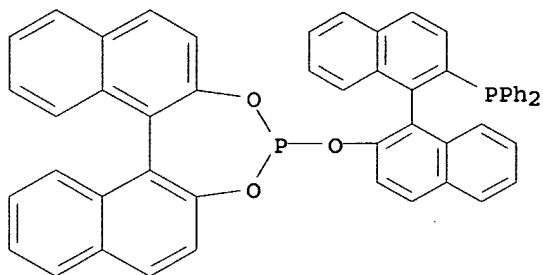
AB The **prepn.** of novel **phosphine** compds., e.g. I  
(R4, R4' = H, lower alkyl, alkoxy; R3, R3', R9, R9' = H, lower alkyl, alkoxy, halo; R3R4, R3'R4' = ring; R5, R6 = (un)substituted Ph, halo, lower alkoxy; R7, R8 = (un)substituted Ph; R7R8 = divalent hydrocarbon), useful in the form of their **transition metal** complexes, of or compds. with **transition metals**, in producing an optically active aldehyde by hydroformylation of an olefin with high positional and steric selectivities, are described. 4-[(R)-1'-formylethyl]azetidin-2-one derivs. obtainable by the process is particularly useful as an intermediate for the **prepn.** of carbapenem antibiotics. Thus, reaction of (±)-3,3'-dichloro-2,2',4,4'-tetramethyl-6-diphenylphosphino-6'-hydroxybiphenyl (**prepn.** given) with (R)-1,1'-binaphthalene-2,2'-diyldioxychlorophosphine (**prepn.** given) in PhMe in the presence of Et3N gave (S)-3,3'-dichloro-2,2',4,4'-tetramethyl-6-diphenylphosphinobiphenyl-6'-yloxy((R)-1,1'-binaphthalene-2,2'-diyldioxy)**phosphine** (II). Hydroformylation of styrene in the presence of Rh(acac)(CO)2 (catalyst) and **ligand** II gave good yield of (S)-(+)-2-phenylpropanal with 94% enantiomeric excess.

IT 149917-85-1P 149917-86-2P 149917-87-3P  
 149952-92-1P 155566-52-2P 155566-53-3P  
 155613-50-6P 155613-51-7P 159496-88-5P  
 159496-92-1P 159496-94-3P 159496-96-5P  
 159573-28-1P 159573-29-2P 159573-30-5P  
 159573-31-6P 159573-32-7P 159573-33-8P  
 159573-34-9P

RL: CAT (Catalyst use); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)  
 (prepn. of diphosphines and rhodium complexes and their use for producing optically active aldehydes and formylethylazetidinone derivs.)

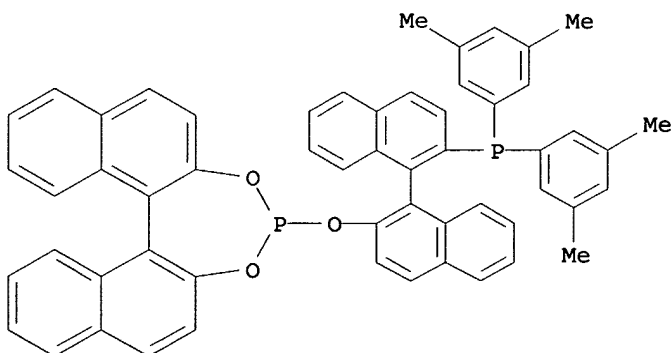
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CN Dinaphtho[2,1-d:1',2'-f][1,3,2]dioxaphosphepin, 4-[[[(1R)-2'-(diphenylphosphino)[1,1'-binaphthalen]-2-yl]oxy]-, (11bS)- (9CI)  
 (CA INDEX NAME)



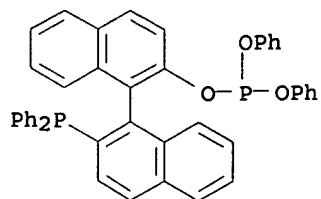
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CN Dinaphtho[2,1-d:1',2'-f][1,3,2]dioxaphosphepin, 4-[[2'-[bis(3,5-dimethylphenyl)phosphino][1,1'-binaphthalen]-2-yl]oxy]-, stereoisomer (9CI) (CA INDEX NAME)



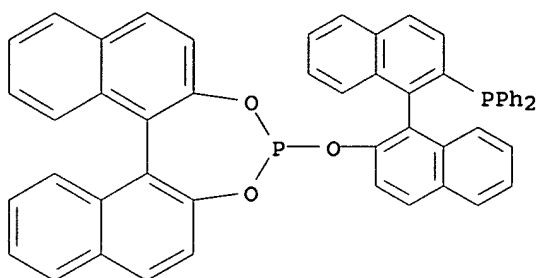
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CN Phosphorous acid, (1R)-2'-(diphenylphosphino)[1,1'-binaphthalen]-2-yl diphenyl ester (9CI) (CA INDEX NAME)



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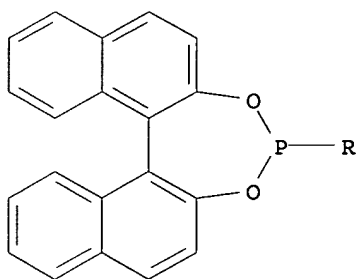
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(CA INDEX NAME)



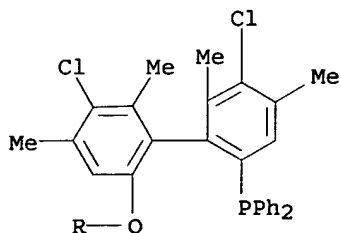
RN 155566-52-2 HCAPLUS

CN Dinaphtho[2,1-d:1',2'-f][1,3,2]dioxaphosphepin, 4-[[3',5-dichloro-6'-(diphenylphosphino)-2',4,4',6-tetramethyl[1,1'-biphenyl]-2-yl]oxy]-, stereoisomer (9CI) (CA INDEX NAME)

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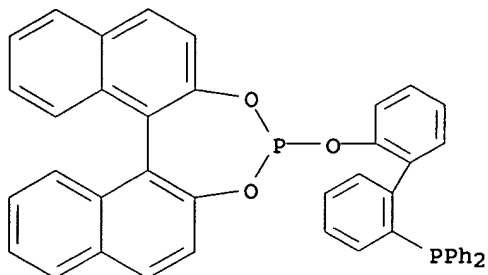
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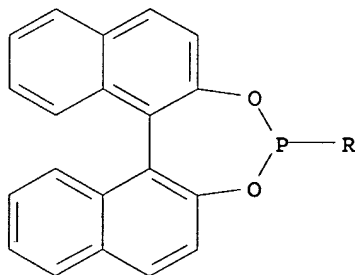
CN Dinaphtho[2,1-d:1',2'-f][1,3,2]dioxaphosphepin, 4-[[2'-(diphenylphosphino)[1,1'-biphenyl]-2-yl]oxy]-, stereoisomer (9CI)  
(CA INDEX NAME)



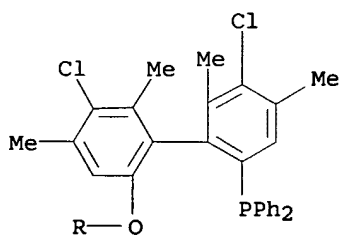
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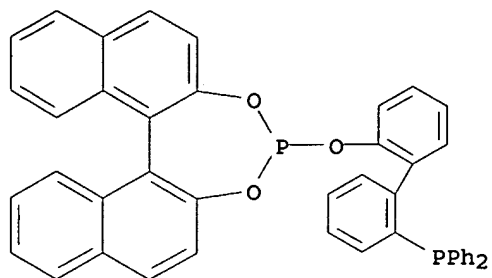


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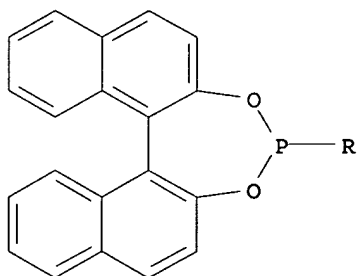
RN 155613-51-7 HCAPLUS

CN Dinaphtho[2,1-d:1',2'-f][1,3,2]dioxaphosphepin, 4-[[2'-(diphenylphosphino)[1,1'-biphenyl]-2-yl]oxy]-, stereoisomer (9CI)  
(CA INDEX NAME)

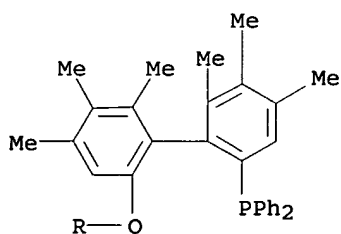


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 CN Dinaphtho[2,1-d:1',2'-f][1,3,2]dioxaphosphepin, 4-[[6'-(diphenylphosphino)-2,2',3,3',4,4'-hexamethyl[1,1'-biphenyl]-2-yl]oxy]-, stereoisomer (9CI) (CA INDEX NAME)

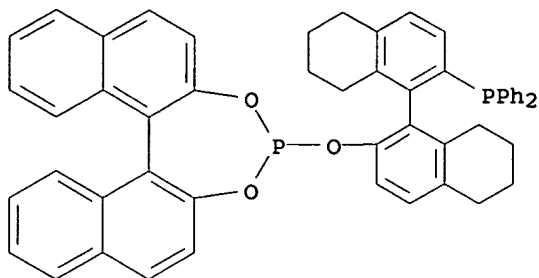
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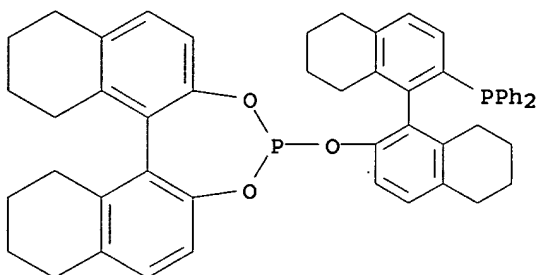


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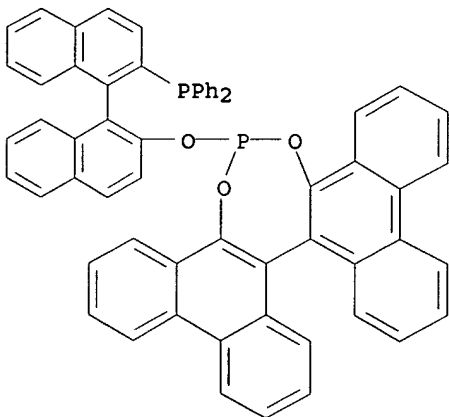
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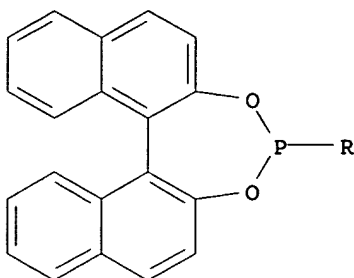
CN Diphenanthro[9,10-d:9',10'-f][1,3,2]dioxaphosphhepin, 18-[[2'-(diphenylphosphino)[1,1'-binaphthalen]-2-yl]oxy]-, stereoisomer (9CI) (CA INDEX NAME)



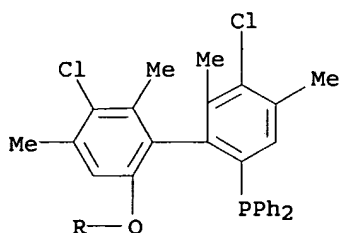
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CN Dinaphtho[2,1-d:1',2'-f][1,3,2]dioxaphosphhepin, 4-[[3',5-dichloro-6'-(diphenylphosphino)-2',4,4',6-tetramethyl[1,1'-biphenyl]-2-yl]oxy]-, stereoisomer (9CI) (CA INDEX NAME)

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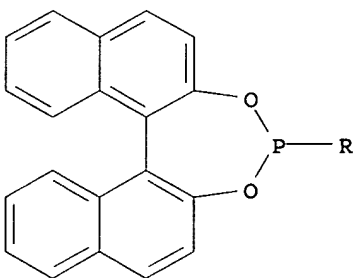


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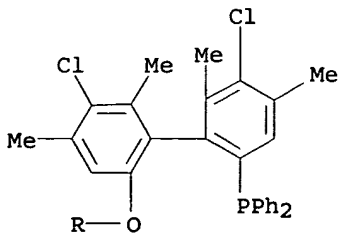


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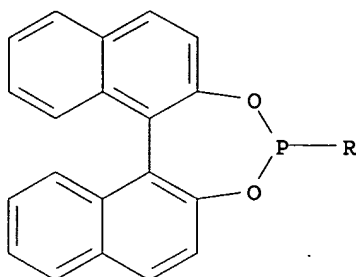
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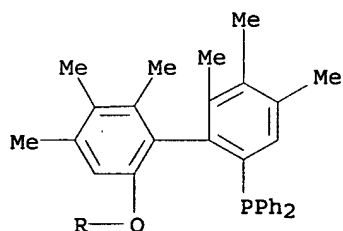
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CN Dinaphtho[2,1-d:1',2'-f][1,3,2]dioxaphosphepin, 4-[[6'-(diphenylphosphino)-2,2',3,3',4,4'-hexamethyl[1,1'-biphenyl]-2-yl]oxy]-, stereoisomer (9CI) (CA INDEX NAME)

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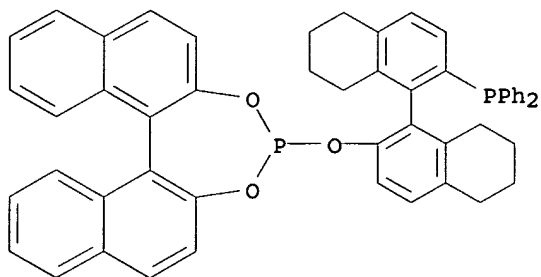


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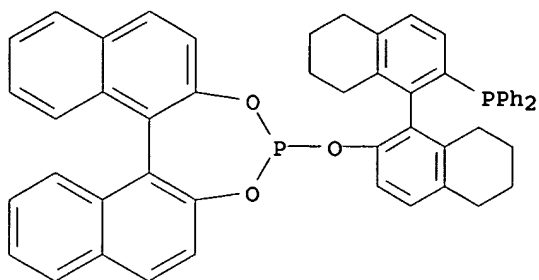
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CN Dinaphtho[2,1-d:1',2'-f][1,3,2]dioxaphosphepin, 4-[[2'-(diphenylphosphino)-5,5',6,6',7,7',8,8'-octahydro[1,1'-binaphthalen]-2-yl]oxy]-, stereoisomer (9CI) (CA INDEX NAME)



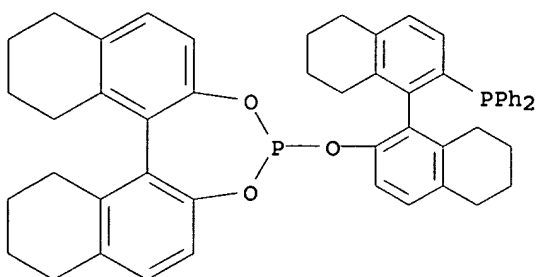
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CN Dinaphtho[2,1-d:1',2'-f][1,3,2]dioxaphosphepin, 4-[[2'-(diphenylphosphino)-5,5',6,6',7,7',8,8'-octahydro[1,1'-binaphthalen]-2-yl]oxy]-, stereoisomer (9CI) (CA INDEX NAME)



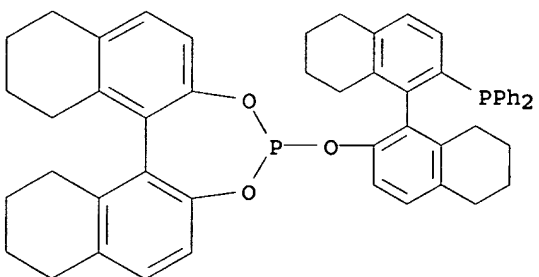
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CN Dinaphtho[2,1-d:1',2'-f][1,3,2]dioxaphosphepin, 4-[[2'-(diphenylphosphino)-5,5',6,6',7,7',8,8'-octahydro[1,1'-binaphthalen]-2-yl]oxy]-8,9,10,11,12,13,14,15-octahydro-, stereoisomer (9CI) (CA INDEX NAME)



RN 159573-34-9 HCAPLUS

CN Dinaphtho[2,1-d:1',2'-f][1,3,2]dioxaphosphepin, 4-[[2'-(diphenylphosphino)-5,5',6,6',7,7',8,8'-octahydro[1,1'-binaphthalen]-2-yl]oxy]-8,9,10,11,12,13,14,15-octahydro-, stereoisomer (9CI) (CA INDEX NAME)



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159398-07-9P 159398-08-0P 159398-09-1P  
159398-10-4P 159516-49-1P 159516-56-0P  
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RL: CAT (Catalyst use); SPN (Synthetic preparation);

PREP (Preparation); USES (Uses)

(prepn. of diphosphines and rhodium complexes and their use for producing optically active aldehydes and formylethylazetidinone derivs.)

RN 159398-04-6 HCAPLUS

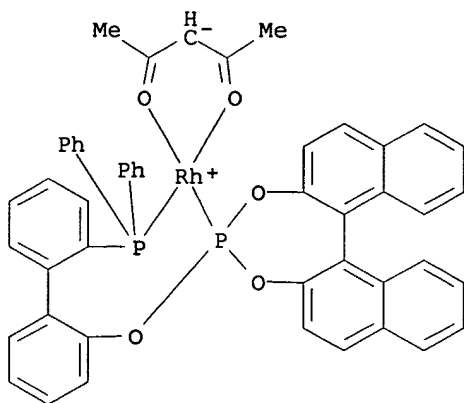
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f] [1,3,2]dioxaphosphepin- $\kappa$ P4] (2,4-pentanedionato- $\kappa$ O, $\kappa$ O')-, stereoisomer (9CI) (CA INDEX NAME)

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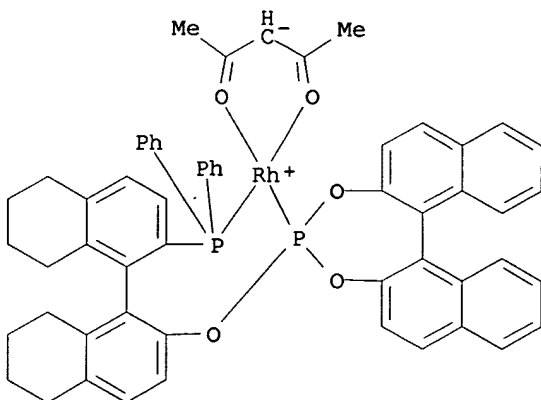
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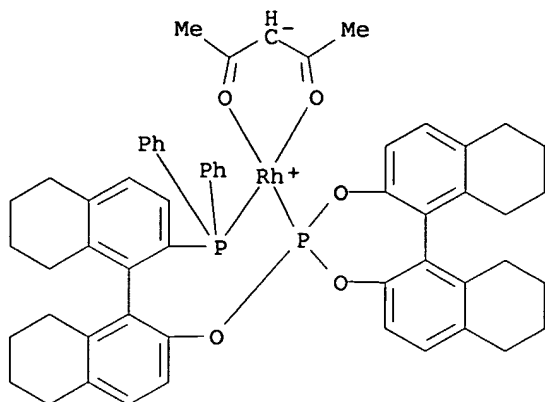
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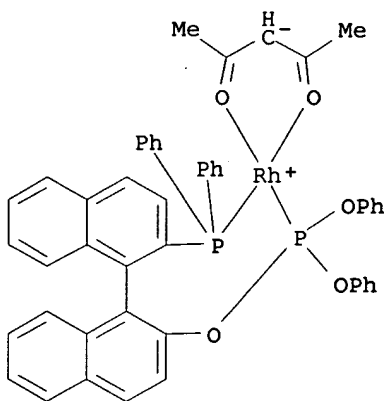
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CN Rhodium, [4-[[2'-(diphenylphosphino)-5,5',6,6',7,7',8,8'-octahydro[1,1'-binaphthalen]-2-yl]oxy]-8,9,10,11,12,13,14,15-octahydrodinaphtho[2,1-d:1',2'-f] [1,3,2]dioxaphosphepin-P4,P4'] (2,4-pentanedionato-O,O')-, stereoisomer (9CI) (CA INDEX NAME)



RN 159398-08-0 HCAPLUS

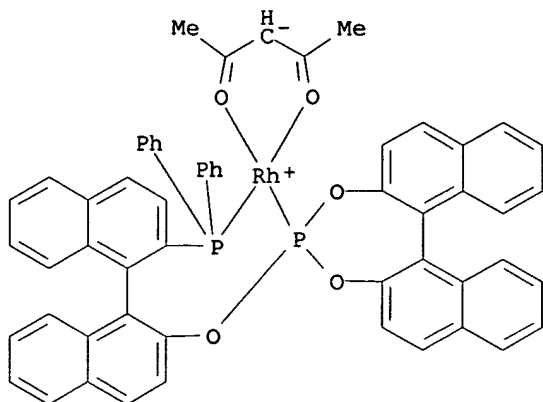
CN Rhodium, [2'-(diphenylphosphino)[1,1'-binaphthalen]-2-yl diphenyl phosphite-P,P'] (2,4-pentanedionato-O,O')-, [SP-4-3-(R)]- (9CI) (CA INDEX NAME)



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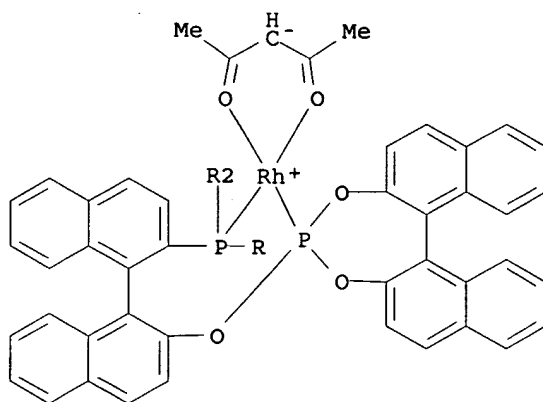
CN Rhodium, [4-[[2'-(diphenylphosphino-κP)[1,1'-binaphthalen]-2-yl]oxy]dinaphtho[2,1-d:1',2'-f][1,3,2]dioxaphosphepin-κP4] (2,4-pentanedionato-κO,κO')-, stereoisomer (9CI) (CA INDEX NAME)



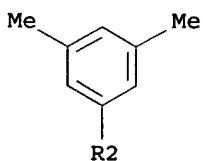
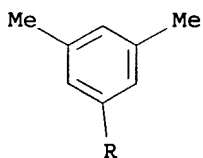


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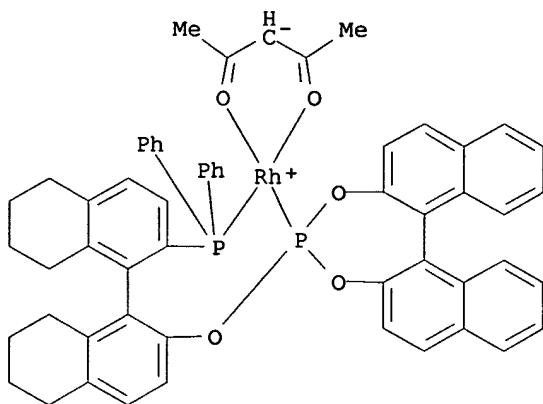
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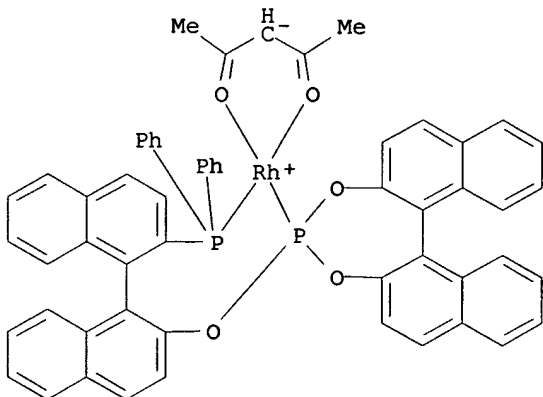
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RN 159516-49-1 HCAPLUS  
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RN 159516-56-0 HCAPLUS  
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 CN Rhodium, [4-[[3',5-dichloro-6'-(diphenylphosphino-κP)-2',4,4',6-tetramethyl[1,1'-biphenyl]-2-yl]oxy]dinaphtho[2,1-d:1',2'-f][1,3,2]dioxaphosphepin-κP4] (2,4-pentanedionato-κO,κO')-, stereoisomer (9CI) (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

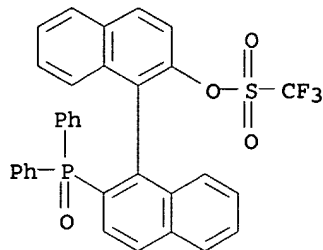
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RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(prepn. of diphosphines and rhodium complexes and their use for producing optically active aldehydes and formylethylazetidinone derivs.)

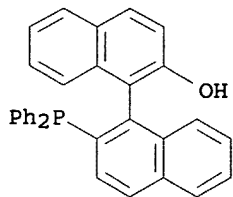
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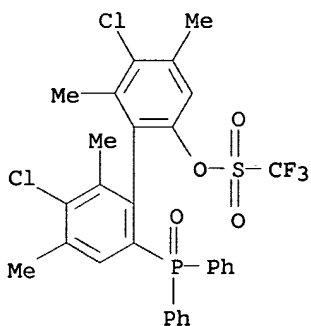
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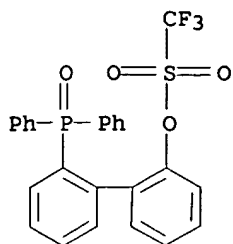
RN 155566-48-6 HCAPLUS

CN Methanesulfonic acid, trifluoro-, 3',5-dichloro-6'-(diphenylphosphinyl)-2',4,4',6-tetramethyl[1,1'-biphenyl]-2-yl ester (9CI) (CA INDEX NAME)



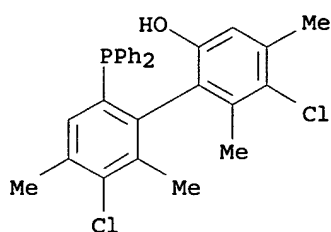
RN 155566-49-7 HCAPLUS

CN Methanesulfonic acid, trifluoro-, 2'-(diphenylphosphinyl)[1,1'-biphenyl]-2-yl ester (9CI) (CA INDEX NAME)



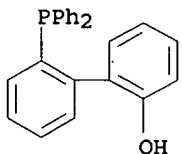
RN 155566-50-0 HCAPLUS

CN [1,1'-Biphenyl]-2-yl, 3',5-dichloro-6'-(diphenylphosphino)-2',4,4',6-tetramethyl- (9CI) (CA INDEX NAME)



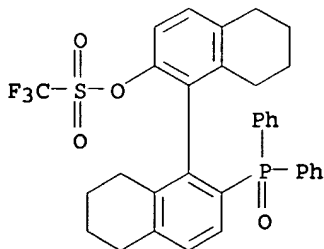
RN 155566-51-1 HCAPLUS

CN [1,1'-Biphenyl]-2-yl, 2'-(diphenylphosphino)- (9CI) (CA INDEX NAME)



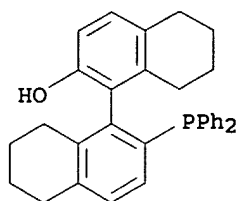
RN 159496-90-9 HCAPLUS

CN Methanesulfonic acid, trifluoro-, (1R)-2'-(diphenylphosphinyl)-5,5',6,6',7,7',8,8'-octahydro[1,1'-binaphthalen]-2-yl ester (9CI) (CA INDEX NAME)

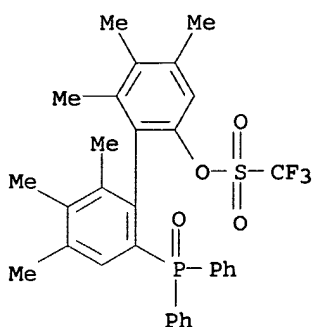


RN 159496-91-0 HCAPLUS

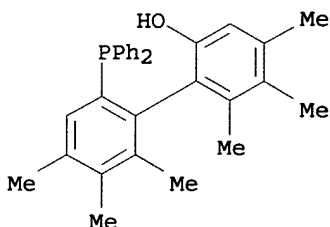
CN [1,1'-Binaphthalen]-2-yl, 2'-(diphenylphosphino)-5,5',6,6',7,7',8,8'-octahydro-, (R)- (9CI) (CA INDEX NAME)



RN 179893-89-1 HCAPLUS  
 CN Methanesulfonic acid, trifluoro-, 6'-(diphenylphosphinyl)-2',3',4,4',5,6-hexamethyl[1,1'-biphenyl]-2-yl ester (9CI) (CA INDEX NAME)



RN 179893-90-4 HCAPLUS  
 CN [1,1'-Biphenyl]-2-ol, 6'-(diphenylphosphino)-2',3',4,4',5,6-hexamethyl- (9CI) (CA INDEX NAME)



IC ICM C07F009-50  
 ICS C07F015-00; C07C045-50; C07F009-6574; C07F009-6568; C07D205-08  
 CC 29-7 (Organometallic and Organometalloidal Compounds)  
 Section cross-reference(s): 26, 67, 78  
 IT 3375-31-3, Palladium acetate 12092-47-6 149952-93-2  
 159398-11-5 159496-99-8  
 RL: CAT (Catalyst use); USES (Uses)  
 (prepn. of diphosphines and rhodium complexes and their use for producing optically active aldehydes and formylethylazetidinone derivs.)  
 IT 31096-69-2  
 RL: CAT (Catalyst use); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)  
 (prepn. of diphosphines and rhodium complexes and their use for producing optically active aldehydes and formylethylazetidinone derivs.)  
 IT 149917-85-1P 149917-86-2P 149917-87-3P  
 149952-92-1P 155566-52-2P 155566-53-3P

155613-50-6P 155613-51-7P 159496-88-5P  
159496-92-1P 159496-94-3P 159496-96-5P  
159573-28-1P 159573-29-2P 159573-30-5P  
159573-31-6P 159573-32-7P 159573-33-8P  
159573-34-9P

RL: CAT (Catalyst use); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)

(prepn. of diphosphines and rhodium complexes and their use for producing optically active aldehydes and formylethylazetidinone derivs.)

IT 159398-04-6P 159398-05-7P 159398-06-8P  
159398-07-9P 159398-08-0P 159398-09-1P  
159398-10-4P 159516-49-1P 159516-56-0P  
159518-56-6P

RL: CAT (Catalyst use); SPN (Synthetic preparation);

PREP (Preparation); USES (Uses)

(prepn. of diphosphines and rhodium complexes and their use for producing optically active aldehydes and formylethylazetidinone derivs.)

IT 17763-95-0P 34638-21-6P 65355-14-8P 126613-06-7P  
132532-04-8P 137156-22-0P 149917-88-4P  
155566-46-4P 155566-47-5P 155566-48-6P  
155566-49-7P 155566-50-0P 155566-51-1P  
155613-52-8P 159496-89-6P 159496-90-9P  
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179893-89-1P 179893-90-4P

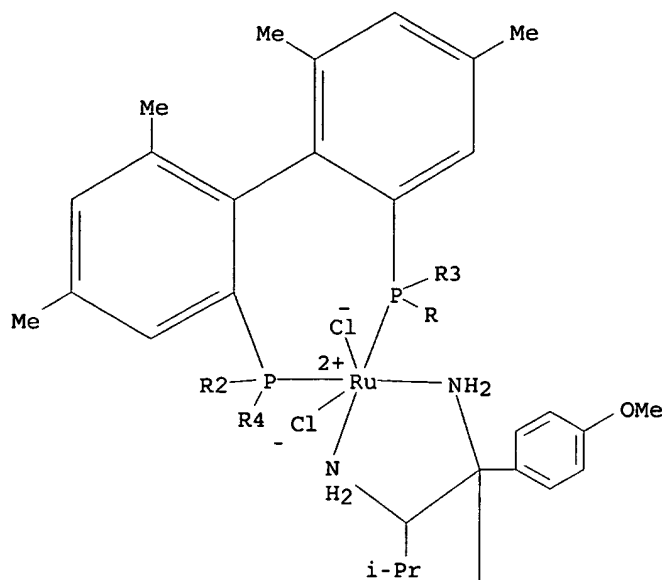
RL: RCT (Reactant); SPN (Synthetic preparation); PREP

(Preparation); RACT (Reactant or reagent)

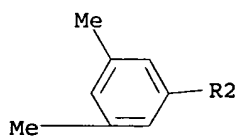
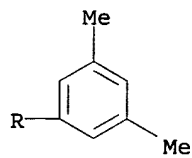
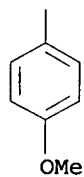
(prepn. of diphosphines and rhodium complexes and their use for producing optically active aldehydes and formylethylazetidinone derivs.)

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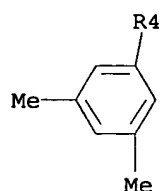
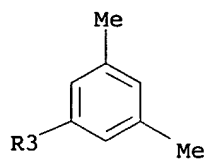
PAGE 1-A



PAGE 2-A

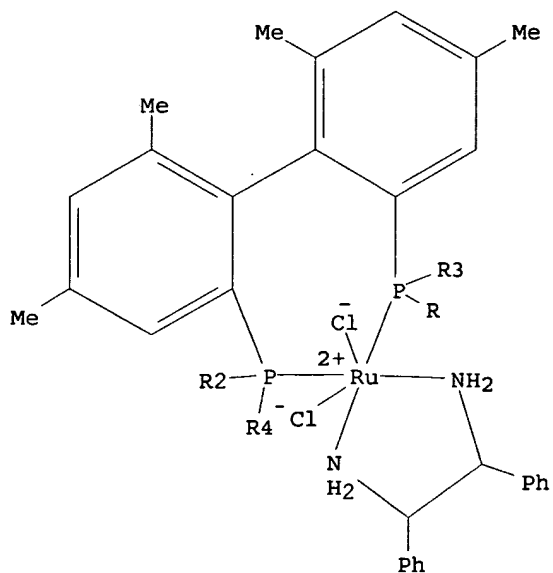


PAGE 3-A



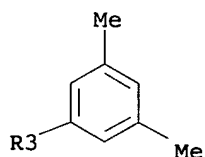
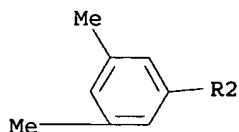
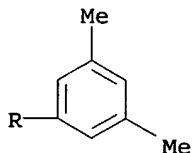
RN 600135-73-7 HCAPLUS  
 CN Ruthenium, dichloro[(1S,2S)-1,2-diphenyl-1,2-ethanediamine- $\kappa$ N, $\kappa$ N'][[{(1S)-4,4',6,6'-tetramethyl[1,1'-biphenyl]-2,2'-diyl]bis[bis(3,5-dimethylphenyl)phosphine- $\kappa$ P]]-, (OC-6-13)-(9CI) (CA INDEX NAME)

PAGE 1-A

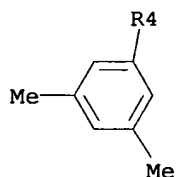




PAGE 2-A



PAGE 3-A



CC 25-7 (Benzene, Its Derivatives, and Condensed Benzenoid Compounds)

IT 540744-45-4P 540744-46-5P 600127-09-1P

600135-73-7P

RL: CAT (Catalyst use); SPN (Synthetic preparation);

PREP (Preparation); USES (Uses)

(prepn. of a xylyl biaryl diphosphine

ligand for asym. hydrogenation of ketones)

REFERENCE COUNT: 27 THERE ARE 27 CITED REFERENCES AVAILABLE  
FOR THIS RECORD. ALL CITATIONS AVAILABLE  
IN THE RE FORMAT

L26 ANSWER 25 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2003:295444 HCAPLUS

DOCUMENT NUMBER: 139:36590

TITLE: SYNPHOS: a New Atropisomeric Diphosphine Ligand.  
From Laboratory-scale Synthesis to Scale-up  
Development

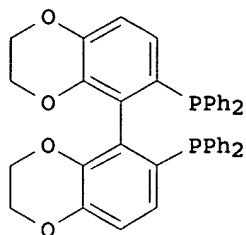
AUTHOR(S): Duprat de Paule, Sebastien; Jeulin, Severine;  
Ratovelomanana-Vidal, Virginie; Genet,  
Jean-Pierre; Champion, Nicolas; Deschaux,  
Gilles; Dellis, Philippe

CORPORATE SOURCE: Laboratoire de Synthese Selective Organique et  
Produits Naturels, ENSCP, Paris, 75231, Fr.

SOURCE: Organic Process Research & Development (  
2003), 7(3), 399-406

CODEN: OPRDFK; ISSN: 1083-6160

PUBLISHER: American Chemical Society  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 OTHER SOURCE(S): CASREACT 139:36590  
 GI



I

AB A new optically active diphosphine ligand, [(5,6),(5',6')-bis(ethylenedioxy)biphenyl-2,2'-diyl]bis(diphenylphosphine) (SYNPHOS) I has been synthesized. Lab.-scale synthesis and scale-up development of this ligand are described herein. This new atropisomeric diphosphine was also used in ruthenium-catalyzed asym. hydrogenation.

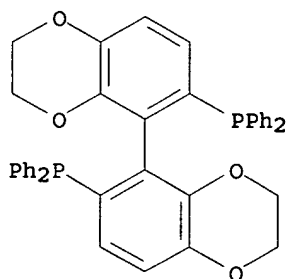
IT 445467-61-8P, (+)-(R)-SYNPHOS 503538-68-9P,  
 (-)-(S)-SYNPHOS

RL: CAT (Catalyst use); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)

(scale-up **synthesis** of SYNPHOS as new atropisomeric **diphosphine ligand** for ruthenium catalyzed asym. hydrogenation of ketones)

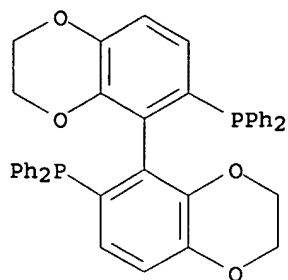
RN 445467-61-8 HCAPLUS

CN Phosphine, [(5R)-2,2',3,3'-tetrahydro[5,5'-bi-1,4-benzodioxin]-6,6'-diyl]bis[diphenyl- (9CI) (CA INDEX NAME)



RN 503538-68-9 HCAPLUS

CN Phosphine, [(5S)-2,2',3,3'-tetrahydro[5,5'-bi-1,4-benzodioxin]-6,6'-diyl]bis[diphenyl- (9CI) (CA INDEX NAME)



CC 29-7 (Organometallic and Organometalloidal Compounds)

Section cross-reference(s): 21

IT 445467-61-8P, (+)-(R)-SYNPHOS 503538-68-9P, (-)-(S)-SYNPHOS

RL: CAT (Catalyst use); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)

(scale-up synthesis of SYNPHOS as new atropisomeric diphosphine ligand for ruthenium catalyzed asym. hydrogenation of ketones)

REFERENCE COUNT: 29 THERE ARE 29 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L26 ANSWER 26 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2003:262780 HCAPLUS

DOCUMENT NUMBER: 138:280367

TITLE: Preparation of bis(alkylenedioxy)biphenyldiylidip hosphines, their complexes with transition metals, and their use as asymmetric synthesis catalysts

INVENTOR(S): Duprat De Paule, Sebastien; Champion, Nicolas; Vidal, Virginie; Genet, Jean Pierre; Dellis, Philippe

PATENT ASSIGNEE(S): Synkem, Fr.

SOURCE: Fr. Demande, 29 pp.

CODEN: FRXXBL

DOCUMENT TYPE: Patent

LANGUAGE: French

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
FR 2830254	A1	20030404	FR 2001-12499	20010928
FR 2830254	B1	20040917		
CA 2462045	AA	20030410	CA 2002-2462045	20020916
WO 2003029259	A1	20030410	WO 2002-FR3146	20020916

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ,

LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ,  
 NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ,  
 TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW  
 RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ,  
 BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK,  
 EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR,  
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EP 1436304 A1 20040714 EP 2002-800152 200209  
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 BR 2002012763 A 20041013 BR 2002-12763 200209  
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CN 1558908 A 20041229 CN 2002-818813 <--  
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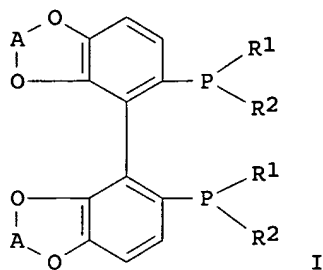
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PRIORITY APPLN. INFO.: <--  
 FR 2001-12499 A 200109  
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 WO 2002-FR3146 W 200209  
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OTHER SOURCE(S): <--  
 CASREACT 138:280367; MARPAT 138:280367  
 GI



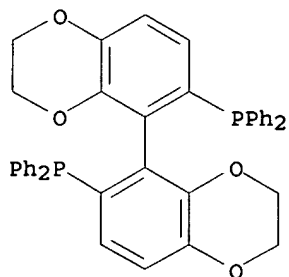
AB The invention relates to new optically pure or racemic bis(alkylenedioxy)biphenyldiyl diphosphines I [R1 and R2 are (C5-C7)cycloalkyl, various (un)substituted Ph, or a 5-membered heteroaryl; A is CH<sub>2</sub>CH<sub>2</sub> or CF<sub>2</sub>], and intermediates in their **prepn.** The invention also relates to I as **ligands** for **transition metal** complexes, which are useful as chiral catalysts in asym. catalysis, esp. asym. hydrogenation and carbon-carbon coupling. Thus, **prepd. ligand** (S)-I (R1 = R2 = Ph, A = CH<sub>2</sub>CH<sub>2</sub>) and (1,5-cyclooctadiene)bis(methylallyl)ruthenium in acetone were reacted with HBr in MeOH to generate a chiral catalyst in situ. Hydrogenation of MeCOCH<sub>2</sub>CO<sub>2</sub>Me (4 bar at 50° in MeOH, 24 h) in the presence of the catalyst afforded (S)-MeCH(OH)CH<sub>2</sub>CO<sub>2</sub>Me in >99% e.e.

IT 445467-61-8P 503538-68-9P 503538-69-0P  
503538-70-3P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(prepn. and complexation with transition metals to give asym. synthesis catalysts)

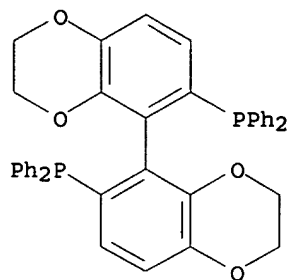
RN 445467-61-8 HCAPLUS

CN Phosphine, [(5R)-2,2',3,3'-tetrahydro[5,5'-bi-1,4-benzodioxin]-6,6'-diyl]bis[diphenyl- (9CI) (CA INDEX NAME)



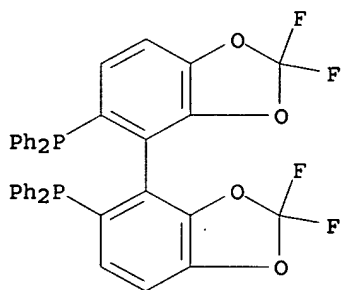
RN 503538-68-9 HCAPLUS

CN Phosphine, [(5S)-2,2',3,3'-tetrahydro[5,5'-bi-1,4-benzodioxin]-6,6'-diyl]bis[diphenyl- (9CI) (CA INDEX NAME)



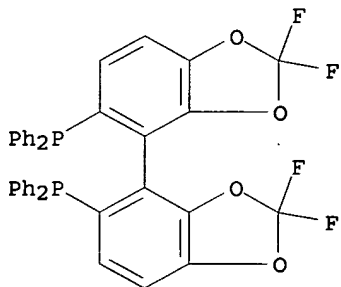
RN 503538-69-0 HCAPLUS

CN Phosphine, [(4R)-2,2,2',2'-tetrafluoro[4,4'-bi-1,3-benzodioxole]-5,5'-diyl]bis[diphenyl- (9CI) (CA INDEX NAME)



RN 503538-70-3 HCAPLUS

CN Phosphine, [(4S)-2,2,2',2'-tetrafluoro[4,4'-bi-1,3-benzodioxole]-5,5'-diyl]bis[diphenyl- (9CI) (CA INDEX NAME)



IT 445467-62-9P

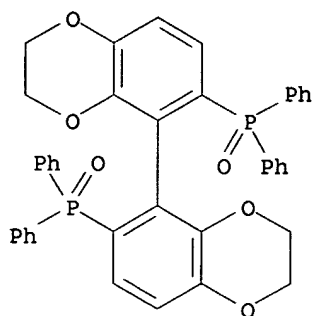
RL: RCT (Reactant); SPN (Synthetic preparation); PREP

(Preparation); RACT (Reactant or reagent)

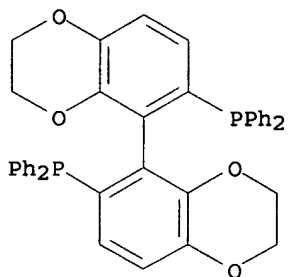
(prepn. and redn. to give bis(alkylenedioxy)biphenyldiyl diphosphine ligand)

RN 445467-62-9 HCAPLUS

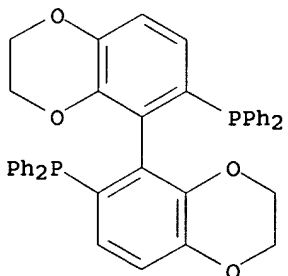
CN Phosphine oxide, [(5R)-2,2',3,3'-tetrahydro[5,5'-bi-1,4-benzodioxin]-6,6'-diyl]bis[diphenyl- (9CI) (CA INDEX NAME)



IT 445467-61-8DP, in situ reaction product with ruthenium complex 503538-68-9DP, in situ reaction product with ruthenium complex  
 RL: CAT (Catalyst use); SPN (Synthetic preparation);  
 PREP (Preparation); USES (Uses)  
 (prepn. as catalyst for asym. hydrogenation)  
 RN 445467-61-8 HCAPLUS  
 CN Phosphine, [(5R)-2,2',3,3'-tetrahydro[5,5'-bi-1,4-benzodioxin]-6,6'-diyl]bis[diphenyl- (9CI) (CA INDEX NAME)]



RN 503538-68-9 HCAPLUS  
 CN Phosphine, [(5S)-2,2',3,3'-tetrahydro[5,5'-bi-1,4-benzodioxin]-6,6'-diyl]bis[diphenyl- (9CI) (CA INDEX NAME)]



IT 503269-77-0P  
 RL: CAT (Catalyst use); SPN (Synthetic preparation);  
 PREP (Preparation); USES (Uses)  
 (prepn. as catalyst for asym. hydrogenation of ketones)  
 RN 503269-77-0 HCAPLUS  
 CN Ruthenate(1-), tri-μ-chlorodichlorobis{[(5S)-2,2',3,3'-tetrahydro[5,5'-bi-1,4-benzodioxin]-6,6'-diyl]bis[diphenylphosphine-κP]}di-, hydrogen, compd. with N-ethylethanamine (1:1) (9CI)  
 (CA INDEX NAME)

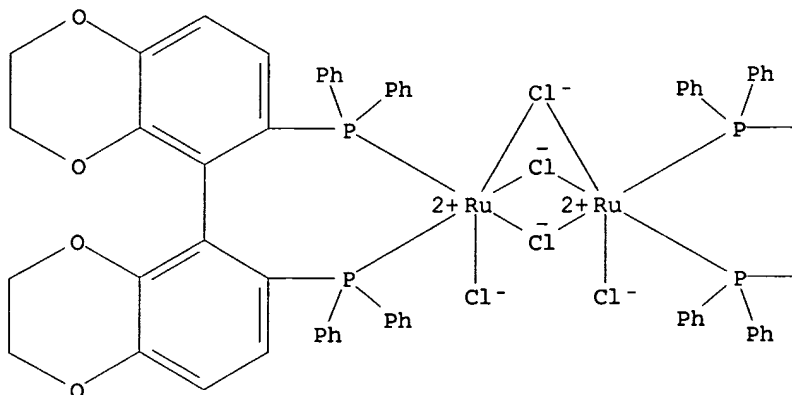
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CRN 503269-76-9

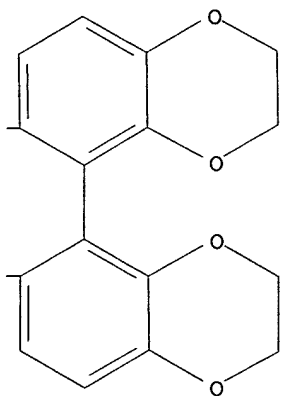
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CCI CCS

PAGE 1-A

● H<sup>+</sup>

PAGE 1-B



CM 2

CRN 109-89-7

CMF C4 H11 N



IT 503269-79-2P 503269-81-6P

RL: CAT (Catalyst use); SPN (Synthetic preparation);

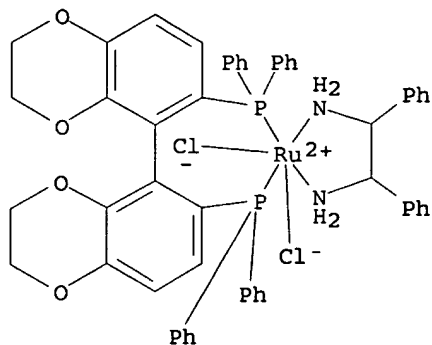
PREP (Preparation); USES (Uses)



(prepn. as catalyst for asym. synthesis)

RN 503269-79-2 HCAPLUS

CN Ruthenium, dichloro[(1S,2S)-1,2-diphenyl-1,2-ethanediamine- $\kappa$ N, $\kappa$ N'][[[(5R)-2,2',3,3'-tetrahydro[5,5'-bi-1,4-benzodioxin]-6,6'-diyl]bis[diphenylphosphine- $\kappa$ P]]-], (OC-6-13)-(9CI) (CA INDEX NAME)



RN 503269-81-6 HCAPLUS

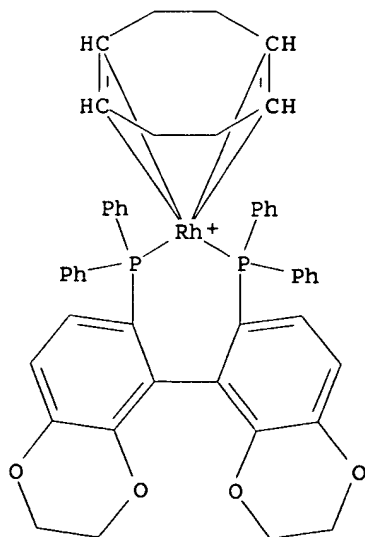
CN Ruthenium(1+), [(1,2,5,6- $\eta$ )-1,5-cyclooctadiene][[(5R)-2,2',3,3'-tetrahydro[5,5'-bi-1,4-benzodioxin]-6,6'-diyl]bis[diphenylphosphine- $\kappa$ P]]-, tetrafluoroborate(1-) (9CI) (CA INDEX NAME)

CM 1

CRN 503269-80-5

CMF C48 H44 O4 P2 Rh

CCI CCS

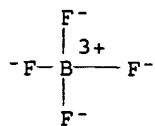


CM 2

CRN 14874-70-5

CMF B F4

CCI CCS



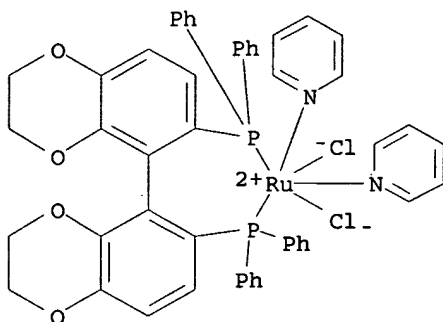
## IT 503269-78-1P

RL: CAT (Catalyst use); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)

(prepn. as catalyst for asym. synthesis and its complex with (S,S)-diphenylethylenediamine)

RN 503269-78-1 HCAPLUS

CN Ruthenium, dichlorobis(pyridine) [[ (5R)-2,2',3,3'-tetrahydro[5,5'-bi-1,4-benzodioxin]-6,6'-diyl]bis[diphenylphosphine-κP]]-, (OC-6-13)- (9CI) (CA INDEX NAME)



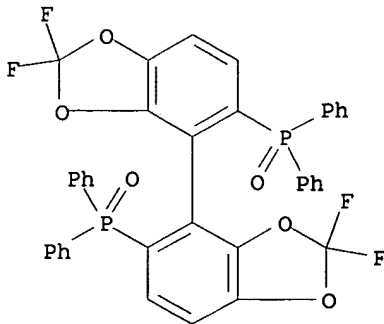
## IT 503538-71-4P 503538-72-5P

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PUR (Purification or recovery); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); PROC (Process); RACT (Reactant or reagent)

(prepn., chromatog. sepn. from enantiomer, and redn. to give bis(alkylenedioxy)biphenyldiylldiphosphine ligand)

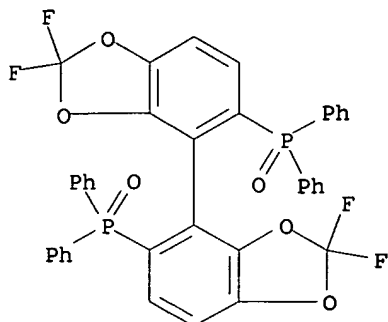
RN 503538-71-4 HCAPLUS

CN Phosphine oxide, [(4R)-2,2,2',2'-tetrafluoro[4,4'-bi-1,3-benzodioxole]-5,5'-diyl]bis[diphenyl- (9CI) (CA INDEX NAME)



RN 503538-72-5 HCAPLUS

CN Phosphine oxide, [(4R)-2,2,2',2'-tetrafluoro[4,4'-bi-1,3-benzodioxole]-5,5'-diyl]bis[diphenyl- (9CI) (CA INDEX NAME)



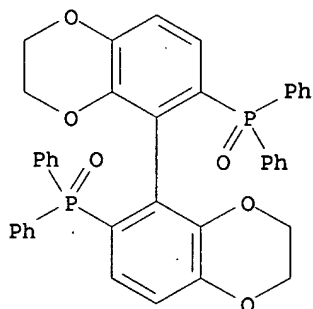
IT 503538-67-8P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP

(Preparation); RACT (Reactant or reagent)

(prepn., sepn. from enantiomer, and redn. to give  
bis(alkylenedioxy)biphenyldiylidiphosphine ligand)

RN 503538-67-8 HCAPLUS

CN Phosphine oxide, [(5S)-2,2',3,3'-tetrahydro[5,5'-bi-1,4-benzodioxin]-  
6,6'-diyl]bis(diphenyl- (9CI) (CA INDEX NAME)

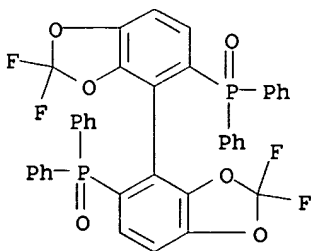
IT 503269-75-8P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP

(Preparation); RACT (Reactant or reagent)

(racemate; prepn. and redn. to give bis(alkylenedioxy)biphenyldiyl  
ldiphosphine ligand)

RN 503269-75-8 HCAPLUS

CN Phosphine oxide, (2,2,2',2'-tetrafluoro[4,4'-bi-1,3-benzodioxole]-  
5,5'-diyl]bis(diphenyl- (9CI) (CA INDEX NAME)

IC ICM C07F009-655

ICS B01J031-28

CC 78-7 (Inorganic Chemicals and Reactions)

Section cross-reference(s): 29, 67

- IT **Ligands**  
 RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
 (chiral; prepn. of bis(alkylenedioxy) biphenyldiylldiphosphines and their transition metal complexes as asym. synthesis catalysts)
- IT Transition metal complexes  
 RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
 (phosphine; prepn. of transition metal bis(alkylenedioxy)biphenyldiylldiphosphine complexes as asym. synthesis catalysts)
- IT Phosphines  
 RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
 (transition metal complexes; prepn. of transition metal bis(alkylenedioxy)biphenyldiylldiphosphine complexes as asym. synthesis catalysts)
- IT 445467-61-8P 503538-68-9P 503538-69-0P 503538-70-3P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
 (prepn. and complexation with transition metals to give asym. synthesis catalysts)
- IT 445467-62-9P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
 (prepn. and redn. to give bis(alkylenedioxy)biphenyldiylldiphosphine ligand)
- IT 12082-47-2DP, (Acetylacetonato)bis(ethylene)rhodium, in situ reaction product with bis(alkylenedioxy)biphenyldiylldiphosphine ligand  
 RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
 (prepn. as catalyst for 1,4-asym. addn. of cyclohexenone with phenylboronic acid)
- IT 445467-61-8DP, in situ reaction product with ruthenium complex 503538-68-9DP, in situ reaction product with ruthenium complex  
 RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
 (prepn. as catalyst for asym. hydrogenation)
- IT 10049-08-8DP, Ruthenium trichloride, reaction product with bis(alkylenedioxy)biphenyldiylldiphosphine ligand 12289-94-0DP, reaction product with bis(alkylenedioxy)biphenyldiylldiphosphine ligand 503269-77-0P  
 RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
 (prepn. as catalyst for asym. hydrogenation of ketones)
- IT 503269-79-2P 503269-81-6P  
 RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
 (prepn. as catalyst for asym. synthesis)
- IT 503269-78-1P  
 RL: CAT (Catalyst use); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)  
 (prepn. as catalyst for asym. synthesis and its complex with (S,S)-diphenylethylenediamine)
- IT 7439-88-5DP, Iridium, complexes with bis(alkylenedioxy)biphenyldiylldiphosphine ligand 7440-02-0DP, Nickel, complexes with bis(alkylenedioxy)biphenyldiylldiphosphine ligand 7440-05-3DP, Palladium, complexes with bis(alkylenedioxy)biphenyldiylldiphosphine ligand 7440-16-6DP, Rhodium, complexes with bis(alkylenedioxy)biphenyldiylldiphosphine ligand 7440-18-8DP, Ruthenium, complexes with bis(alkylenedioxy)biphenyldiylldiphosphine

ligand 7440-50-8DP, Copper, complexes with  
 bis(alkylenedioxy)biphenyldiylldiphosphine ligand  
 RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP  
 (Preparation); USES (Uses)  
 (prepn. as catalysts for asym. synthesis)

IT 503538-71-4P 503538-72-5P

RL: CPS (Chemical process); PEP (Physical, engineering or chemical  
 process); PUR (Purification or recovery); RCT (Reactant); SPN  
 (Synthetic preparation); PREP (Preparation); PROC  
 (Process); RACT (Reactant or reagent)  
 (prepn., chromatog. sepn. from enantiomer, and redn. to give  
 bis(alkylenedioxy)biphenyldiylldiphosphine ligand)

IT 503538-67-8P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP  
 (Preparation); RACT (Reactant or reagent)  
 (prepn., sepn. from enantiomer, and redn. to give  
 bis(alkylenedioxy)biphenyldiylldiphosphine ligand)

IT 503269-75-8P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP  
 (Preparation); RACT (Reactant or reagent)  
 (racemate; prepn. and redn. to give bis(alkylenedioxy)biphenyldiyl  
 ldiphosphine ligand)

REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR  
 THIS RECORD. ALL CITATIONS AVAILABLE IN  
 THE RE FORMAT

L26 ANSWER 27 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2003:216177 HCAPLUS

DOCUMENT NUMBER: 139:214664

TITLE: Preparation of an optically active  
 bis(diethylphosphino)biphenyl ligand designed  
 for highly reactive catalytic processes  
 AUTHOR(S): Shibata, Tomomi; Tsuruta, Hideyuki; Danjo,  
 Hiroshi; Imamoto, Tsuneo  
 CORPORATE SOURCE: Faculty of Science, Department of Chemistry,  
 Chiba University, Inage-ku, Chiba, 263-8522,  
 Japan

SOURCE: Journal of Molecular Catalysis A: Chemical ( 2003), 196(1-2), 117-124  
 CODEN: JMCCF2; ISSN: 1381-1169

PUBLISHER: Elsevier Science B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

OTHER SOURCE(S): CASREACT 139:214664

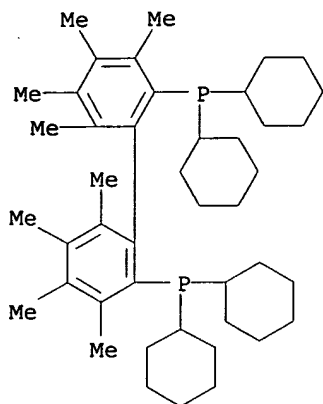
AB New optically active diphosphine ligands, (S)-2,2'-  
 bis(diphenylphosphino)-3,3',4,4',5,5',6,6'-octamethylbiphenyl and  
 (S)-2,2'-bis(diethylphosphino)-3,3',4,4',5,5',6,6'-  
 octamethylbiphenyl (2c) were prepd. via optical resolu. of the  
 corresponding phosphine oxides. The Rh complex of 2c proved  
 efficient in the catalytic asym. hydrogenation of a dehydroamino  
 acid deriv. even at -50 °C and gave 88% e.e. of hydrogenation  
 product quant.

IT 586410-79-9P 590383-54-3P

RL: CAT (Catalyst use); RCT (Reactant); SPN (Synthetic  
 preparation); PREP (Preparation); RACT (Reactant or  
 reagent); USES (Uses)  
 (prepn. of optically-active biphenyl phosphine  
 ligand for rhodium-catalyzed hydrogenation of  
 acetamidocinnamate)

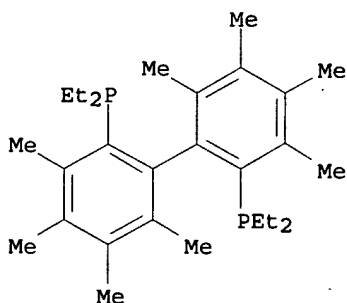
RN 586410-79-9 HCAPLUS

CN Phosphine, (3,3',4,4',5,5',6,6'-octamethyl[1,1'-biphenyl]-2,2'-  
 diyl)bis[dicyclohexyl- (9CI) (CA INDEX NAME)



RN 590383-54-3 HCAPLUS

CN Phosphine, [(1S)-3,3',4,4',5,5',6,6'-octamethyl[1,1'-biphenyl]-2,2'-diyl]bis[diethyl- (9CI) (CA INDEX NAME)



IT 590383-52-1P

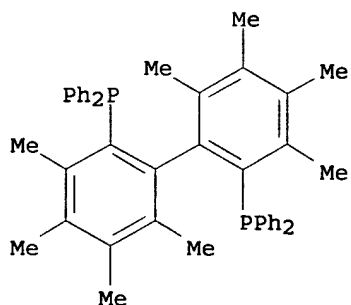
RL: CAT (Catalyst use); SPN (Synthetic preparation);

PREP (Preparation); USES (Uses)

(prepn. of optically-active biphenyl phosphine  
ligand for rhodium-catalyzed hydrogenation of  
acetamidocinnamate)

RN 590383-52-1 HCAPLUS

CN Phosphine, [(1S)-3,3',4,4',5,5',6,6'-octamethyl[1,1'-biphenyl]-2,2'-diyl]bis[diphenyl- (9CI) (CA INDEX NAME)



CC 34-2 (Amino Acids, Peptides, and Proteins)

Section cross-reference(s): 29, 75

IT 586410-79-9P 590383-54-3P

RL: CAT (Catalyst use); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)

(prepn. of optically-active biphenyl phosphine ligand for rhodium-catalyzed hydrogenation of acetamidocinnamate)

IT 590383-52-1P

RL: CAT (Catalyst use); SPN (Synthetic preparation);

PREP (Preparation); USES (Uses)

(prepn. of optically-active biphenyl phosphine ligand for rhodium-catalyzed hydrogenation of acetamidocinnamate)

REFERENCE COUNT: 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L26 ANSWER 28 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2002:943384 HCAPLUS

DOCUMENT NUMBER: 138:187889

TITLE: P-Chiral, Monodentate Ferrocenyl Phosphines, Novel Ligands for Asymmetric Catalysis

AUTHOR(S): Colby, Elizabeth A.; Jamison, Timothy F.

CORPORATE SOURCE: Department of Chemistry, Massachusetts Institute of Technology, Cambridge, MA, 02139, USA

SOURCE: Journal of Organic Chemistry (2003), 68(1), 156-166

CODEN: JOCEAH; ISSN: 0022-3263

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

OTHER SOURCE(S): CASREACT 138:187889

AB Eight P-chiral monodentate ferrocenyl phosphines, e.g. (S)-ferrocenylmethylphenylphosphine, were prepd. in high enantiomeric excess (>95% ee in most cases) by way of an ephedrine-based oxazaphospholidine borane complex. Primary alkyl, secondary alkyl, and substituted arom. substituents were successfully introduced at the phosphorus center, along with ferrocenyl and Ph groups, generating phosphines of the general structure FcP(Ph)(R) (Fc = ferrocenyl, R = aryl, alkyl). The synthetic route employed provides facile access to a previously undeveloped class of chiral monophosphines. These compds. were evaluated as ligands in asym. catalytic reductive coupling of alkynes and aldehydes and were found to provide the desired chiral allylic alcs. with good regioselectivity and ee in many cases and with complete (E)-selectivity (>98:2) in all cases.

IT 497919-40-1P

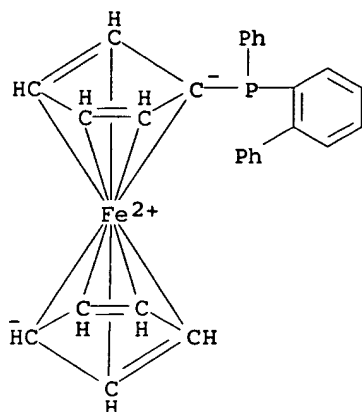
RL: CAT (Catalyst use); SPN (Synthetic preparation);

PREP (Preparation); USES (Uses)

(prepn. of chiral monodentate ferrocenyl phosphines as novel ligands for regioselective nickel catalyzed reductive coupling of alkynes with aldehydes)

RN 497919-40-1 HCAPLUS

CN Ferrocene, [(R)-[1,1'-biphenyl]-2-ylphenylphosphino]- (9CI) (CA INDEX NAME)



CC 29-12 (Organometallic and Organometalloidal Compounds)

Section cross-reference(s): 23

IT 190907-20-1P 497919-31-0P 497919-32-1P 497919-33-2P  
497919-35-4P 497919-36-5P 497919-38-7P 497919-40-1P

RL: CAT (Catalyst use); SPN (Synthetic preparation);

PREP (Preparation); USES (Uses)

(prepn. of chiral monodentate ferrocenyl

phosphines as novel ligands for regioselective

nickel catalyzed reductive coupling of alkynes with aldehydes)

REFERENCE COUNT: 86 THERE ARE 86 CITED REFERENCES AVAILABLE  
FOR THIS RECORD. ALL CITATIONS AVAILABLE  
IN THE RE FORMAT

L26 ANSWER 29 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2002:879182 HCAPLUS

DOCUMENT NUMBER: 138:221639

TITLE: Synthesis of aminophosphine ligands with  
binaphthyl backbones for silver(I)-catalyzed  
enantioselective allylation of benzaldehyde

AUTHOR(S): Wang, Yi; Ji, Bao-Ming; Ding, Kui-Ling  
CORPORATE SOURCE: State Key Laboratory of Organometallic  
Chemistry, Shanghai Institute of Organic  
Chemistry, Chinese Academy of Sciences,  
Shanghai, 200032, Peop. Rep. China

SOURCE: Chinese Journal of Chemistry (2002),  
20(11), 1300-1312

CODEN: CJOCEV; ISSN: 1001-604X

PUBLISHER: Science Press

DOCUMENT TYPE: Journal

LANGUAGE: English

OTHER SOURCE(S): CASREACT 138:221639

AB Aminophosphine ligands with binaphthalene and octahydrobinaphthalene  
backbones were synthesized from 2-amino-2'-hydroxy-1,1'-binaphthyl  
(NOBIN) and 2-amino-2'-hydroxy-5,5',6,6',7,7',8,8'-octahydro-1,1'-  
binaphthyl (H8-NOBIN), resp. Asym. induction efficiency of  
silver(I)-ligand complexes was examd. for allylation of benzaldehyde  
with allyltributyltin, yielding 4-phenyl-4-hydroxy-1-butene (1).  
For example, (S)-1 was obtained (100% yield, 54.5% ee) under  
optimized reaction conditions via allylation catalyzed by  
silver(I)/(S)-(+)-2-pyrrolidino-2'-diphenylphosphino-1,1'-binaphthyl  
complex. Effects of binaphthyl backbone chirality and substituents  
at chelating N, P atoms on enantioselectivity are discussed.

IT 255882-15-6P 413578-90-2P 413578-93-5P  
413578-94-6P 413578-97-9P 413578-98-0P  
500718-20-7P 500718-21-8P 500718-22-9P  
500718-23-0P



RL: CAT (Catalyst use); SPN (Synthetic preparation);

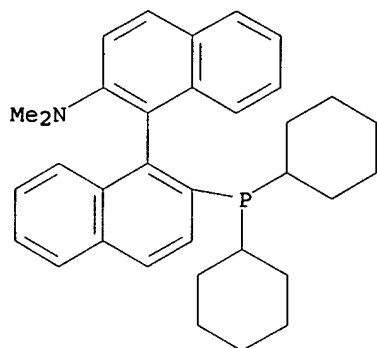
PREP (Preparation); USES (Uses)

(prepn. of aminophosphine ligands

with binaphthalene and octahydronaphthalene backbones for  
silver-catalyzed enantioselective allylation of benzaldehyde with  
allyltributyltin)

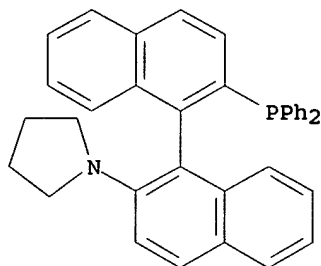
RN 255882-15-6 HCAPLUS

CN [1,1'-Binaphthalen]-2-amine, 2'-(dicyclohexylphosphino)-N,N-dimethyl-, (R)- (9CI) (CA INDEX NAME)



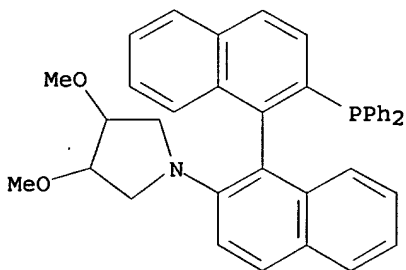
RN 413578-90-2 HCAPLUS

CN Pyrrolidine, 1-[(1S)-2'-(diphenylphosphino)[1,1'-binaphthalen]-2-yl]- (9CI) (CA INDEX NAME)



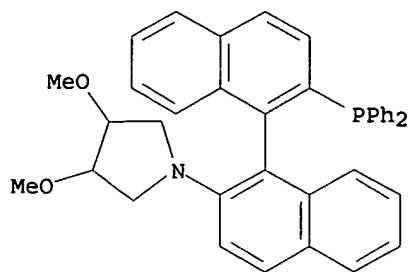
RN 413578-93-5 HCAPLUS

CN Pyrrolidine, 1-[(1S)-2'-(diphenylphosphino)[1,1'-binaphthalen]-2-yl]-3,4-dimethoxy-, (3S,4S)- (9CI) (CA INDEX NAME)



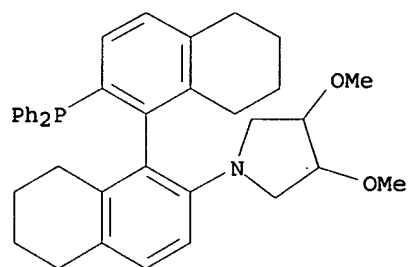
RN 413578-94-6 HCAPLUS

CN Pyrrolidine, 1-[(1R)-2'-(diphenylphosphino)[1,1'-binaphthalen]-2-yl]-3,4-dimethoxy-, (3S,4S)- (9CI) (CA INDEX NAME)



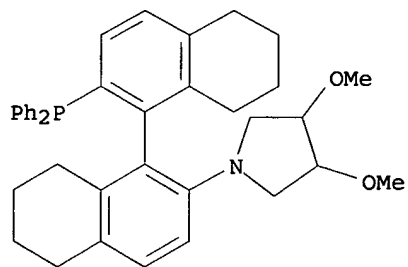
RN 413578-97-9 HCAPLUS

CN Pyrrolidine, 1-[(1S)-2'-(diphenylphosphino)-5,5',6,6',7,7',8,8'-octahydro[1,1'-binaphthalen]-2-yl]-3,4-dimethoxy-, (3S,4S)- (9CI)  
(CA INDEX NAME)



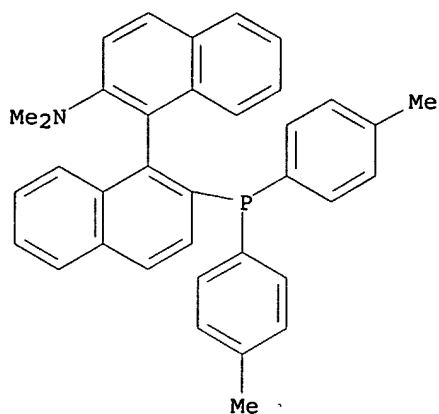
RN 413578-98-0 HCAPLUS

CN Pyrrolidine, 1-[(1R)-2'-(diphenylphosphino)-5,5',6,6',7,7',8,8'-octahydro[1,1'-binaphthalen]-2-yl]-3,4-dimethoxy-, (3S,4S)- (9CI)  
(CA INDEX NAME)

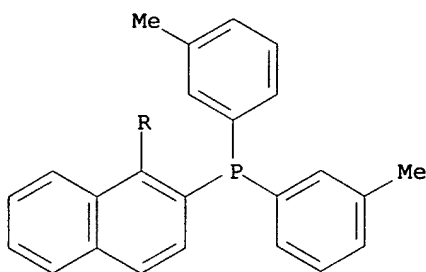


RN 500718-20-7 HCAPLUS

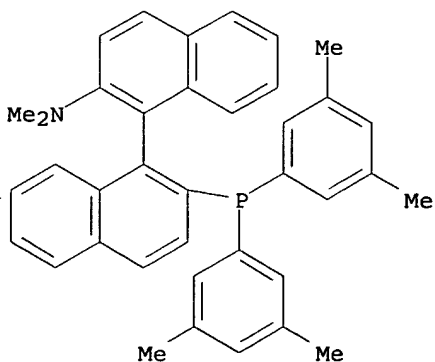
CN [1,1'-Binaphthalen]-2-amine, 2'-[bis(4-methylphenyl)phosphino]-N,N-dimethyl-, (1R)- (9CI) (CA INDEX NAME)



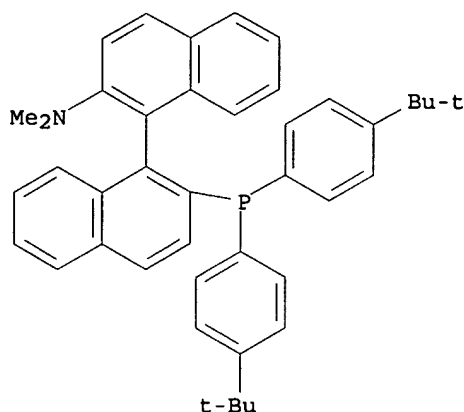
RN 500718-21-8 HCAPLUS  
 CN [1,1'-Binaphthalen]-2-amine, 2'-[bis(3-methylphenyl)phosphino]-N,N-dimethyl-, (1R)- (9CI) (CA INDEX NAME)



RN 500718-22-9 HCAPLUS  
 CN [1,1'-Binaphthalen]-2-amine, 2'-[bis(3,5-dimethylphenyl)phosphino]-N,N-dimethyl-, (1R)- (9CI) (CA INDEX NAME)



RN 500718-23-0 HCAPLUS  
 CN [1,1'-Binaphthalen]-2-amine, 2'-[bis[4-(1,1-dimethylethyl)phenyl]phosphino]-N,N-dimethyl-, (1R)- (9CI) (CA INDEX NAME)



CC 29-7 (Organometallic and Organometalloidal Compounds)  
 Section cross-reference(s): 67  
 IT 255882-15-6P 413578-90-2P 413578-93-5P  
 413578-94-6P 413578-97-9P 413578-98-0P  
 500718-20-7P 500718-21-8P 500718-22-9P  
 500718-23-0P  
 RL: CAT (Catalyst use); SPN (Synthetic preparation);  
 PREP (Preparation); USES (Uses)  
 (prepn. of aminophosphine ligands  
 with binaphthalene and octahydronaphthalene backbones for  
 silver-catalyzed enantioselective allylation of benzaldehyde with  
 allyltributyltin)

REFERENCE COUNT: 34 THERE ARE 34 CITED REFERENCES AVAILABLE  
 FOR THIS RECORD. ALL CITATIONS AVAILABLE  
 IN THE RE FORMAT

L26 ANSWER 30 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2002:750730 HCAPLUS  
 DOCUMENT NUMBER: 137:288102  
 TITLE: Preparation of ruthenium-phosphine-diamine  
 complexes and diamine ligands and method for  
 preparation of optical active alcohols using the  
 ruthenium complex as the catalyst  
 INVENTOR(S): Ooka, Koji; Inoue, Tsutomu  
 PATENT ASSIGNEE(S): Nippon Soda Co., Ltd., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 23 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2002284790	A2	20021003	JP 2002-6604	20020115

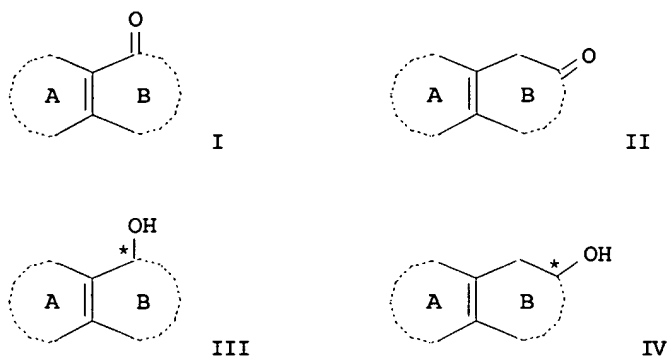
PRIORITY APPLN. INFO.: JP 2001-6256 A

200101

15

OTHER SOURCE(S):  
GI

CASREACT 137:288102; MARPAT 137:288102



AB A method for prepn. of optically active alcs. or  $\beta$ -amino alcs. in high yields with high stereoselectivity by asym. hydrogenation of cyclic ketones or  $\alpha$ -amino ketones using a ruthenium-phosphine-diamine complex and its diamine ligand as the catalyst is provided. Ruthenium-phosphine-diamine complexes represented by formula  $\text{Ru}(X)(Y)(\text{Px})\text{n1}[\text{R1R2C}^*(\text{NR3R4})-\text{A}-\text{C}^*(\text{NR7R8})\text{R5R6}]$  [wherein X,Y = H,halo,  $\text{CO}_2\text{H}$ , HO, C1-20 alkoxy; Px = phosphine ligand; R1 -R9 = H, (un)substituted C1-20 alkyl, C1-20 alkenyl, C3-8 cycloalkyl, aralkyl, or aryl; or either of R1 and R2 is linked to either of R3 and R4 to form a ring; or either of R5 and R6 is linked to either of R7 and R8 to form a ring; A = (un)substituted C1-3 alkylene optionally contg. an ether linkage, C3-8 cycloalkylene, arylene, or or bivalent heterocyclic ring; \* denotes an asym. carbon atom; n1 = 1,2] and diamine ligands represented by formula  $\text{R1R2C}^*(\text{NR3R4})-\text{A}-\text{C}^*(\text{NR7R8})\text{R5R6}$  (R1 -R8 = same as above) are prepd. Also disclosed are (1) asym. hydrogenation of condensed cyclic ketones [I or II; ring A = (un)substituted 3 to 8-membered ring; ring B = (un)substituted 4 to 8-membered ring optionally contg. heteroatoms] to optically active alcs. (III or IV; ring A and B = same as above; \* denotes an asym. carbon atom) or (2) asym. hydrogenation of  $\alpha$ -amino ketones represented by formula  $\text{RaCOCH}(\text{Rb})\text{Rc}$  [wherein Ra, Rc = H, (un)substituted C1-20 alkyl, C2-20 alkenyl, C3-8 cycloalkyl, aralkyl, or aryl; Rb = N(R11)COR9, N(COR10)COR9, NR11R9; R9, R10, R11 = H, CHO, (un)substituted C1-20 alkyl, C2-20 alkenyl, C1-20 alkoxy, C3-8 cycloalkyl, C3-8 cycloalkoxy, aralkyl, aralkyloxy, aryl, or aryloxy; or R9 and R11 or R9 and R10 are linked to each other to form a 5 to 8-membered N-contg. heterocyclic ring] to optically active  $\alpha$ -amino alcs. represented by formula  $\text{RaC}^*(\text{OH})-\text{CH}(\text{Rb})\text{Rc}$  (Ra, Rb, Rc, \* = same as above) using H or hydrogen donor as the H source in the presence of the above ruthenium complex.

IT 466695-99-8P

RL: CAT (Catalyst use); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)

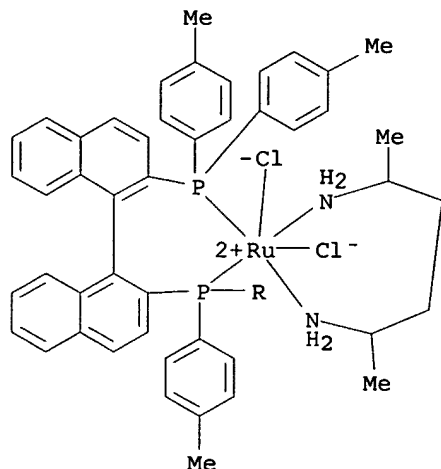
(prepn. of ruthenium-phosphine-diamine complexes and diamine ligands and prepn. of optical active alcs. or  $\beta$ -amino alcs. by asym. hydrogenation of cyclic ketones or  $\alpha$ -amino ketones using ruthenium complex as catalyst)

RN 466695-99-8 HCAPLUS

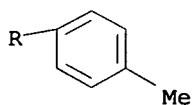
CN Ruthenium, [(1S)-[1,1'-binaphthalene]-2,2'-diylbis[bis(4-

methylphenyl)phosphine-κP]]dichloro[(2R,5R)-2,5-hexanediamine-κN,κN']-, (OC-6-13)- (9CI) (CA INDEX NAME)

PAGE 1-A

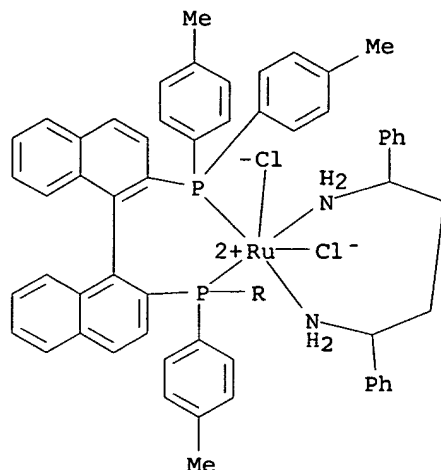


PAGE 2-A

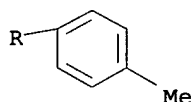


IT 466696-00-4P 466696-02-6P  
 RL: CAT (Catalyst use); SPN (Synthetic preparation);  
 PREP (Preparation); USES (Uses)  
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 complexes and diamine ligands and prepn. of  
 optical active alcs. or β-amino alcs. by asym. hydrogenation  
 of cyclic ketones or α-amino ketones using ruthenium  
 complex as catalyst)  
 RN 466696-00-4 HCAPLUS  
 CN Ruthenium, [(1R)-[1,1'-binaphthalene]-2,2'-diylbis[bis(4-  
 methylphenyl)phosphine-κP]]dichloro[(1R,4R)-1,4-diphenyl-1,4-  
 butanediamine-κN,κN']-, (OC-6-13)- (9CI) (CA INDEX  
 NAME)

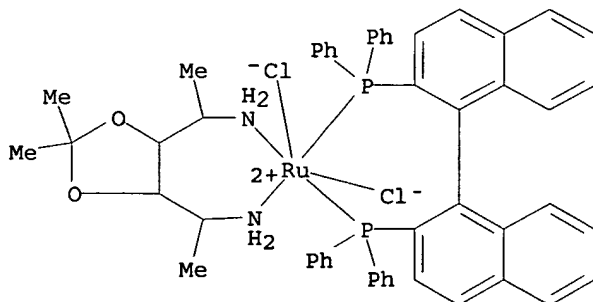
PAGE 1-A



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RN 466696-02-6 HCAPLUS  
 CN Ruthenium, [(1S)-[1,1'-binaphthalene]-2,2'-diylbis[diphenylphosphine-κP]]dichloro[2,5-di(amino-κN)-1,2,5,6-tetradecoxy-3,4-O-(1-methylethylidene)-D-mannitol]-, (OC-6-13)- (9CI) (CA INDEX NAME)



IC ICM C07F015-00  
 ICS B01J031-24; C07B053-00; C07C029-145; C07C033-26; C07C035-27;  
 C07C211-27; C07C231-12; C07C233-73; C07B061-00; C07M007-00  
 CC 78-7 (Inorganic Chemicals and Reactions)  
 IT 466635-81-4P 466695-99-8P  
 RL: CAT (Catalyst use); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)  
 (prepn. of ruthenium-phosphine-diamine complexes and diamine ligands and prepn. of optical active alcs. or β-amino alcs. by asym. hydrogenation of cyclic ketones or α-amino ketones using ruthenium)

complex as catalyst)

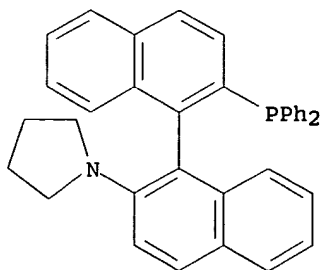
IT 301833-60-3P 466696-00-4P 466696-02-6P  
 RL: CAT (Catalyst use); SPN (Synthetic preparation);  
 PREP (Preparation); USES (Uses)  
 (prepn. of ruthenium-phosphine-diamine  
 complexes and diamine ligands and prepn. of  
 optical active alcs. or  $\beta$ -amino alcs. by asym. hydrogenation  
 of cyclic ketones or  $\alpha$ -amino ketones using ruthenium  
 complex as catalyst)

L26 ANSWER 31 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2001:905633 HCAPLUS  
 DOCUMENT NUMBER: 136:325311  
 TITLE: The synthesis of a new generation of MAP ligands  
 containing two types of chiral elements for  
 asymmetric catalysis  
 AUTHOR(S): Wang, Yi; Li, Xin; Ding, Kuiling  
 CORPORATE SOURCE: State Key Laboratory of Organometallic  
 Chemistry, The Chinese Academy of Sciences,  
 Shanghai Institute of Organic Chemistry,  
 Shanghai, 200032, Peop. Rep. China  
 SOURCE: Tetrahedron Letters (2001), Volume  
 Date 2002, 43(1), 159-161  
 CODEN: TELEAY; ISSN: 0040-4039  
 PUBLISHER: Elsevier Science Ltd.  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 OTHER SOURCE(S): CASREACT 136:325311

AB A series of novel aminophosphine ligands contg. both axial and  
 central chirality have been synthesized for the first time from  
 2-amino-2'-hydroxy-1,1'-binaphthyl and tartaric acid derivs. Their  
 capability for asym. induction in the Pd-catalyzed reaction of  
 1,3-diphenylprop-2-en-1-yl acetate with di-Me malonate was  
 investigated and the results clearly demonstrated that correct  
 assembly of axial chirality in the scaffold and central chirality of  
 the modification group was very important for achieving higher  
 enantioselectivity in the reaction. In a matched case, the asym.  
 allylation product could be obtained in 85.6% ee.

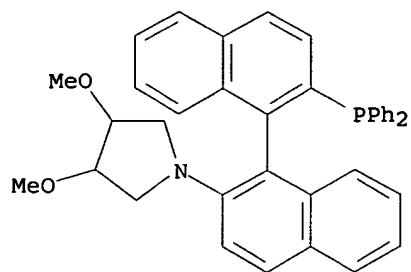
IT 413578-90-2P 413578-93-5P 413578-94-6P  
 413578-97-9P 413578-98-0P  
 RL: CAT (Catalyst use); SPN (Synthetic preparation);  
 PREP (Preparation); USES (Uses)  
 (prepn. of pyrrolidinylbinaphthyldiphenylphosphine  
 chiral ligands for the addn. of malonate to  
 diphenylpropenyl acetate)

RN 413578-90-2 HCAPLUS  
 CN Pyrrolidine, 1-[(1S)-2'-(diphenylphosphino)[1,1'-binaphthalen]-2-yl]-  
 (9CI) (CA INDEX NAME)

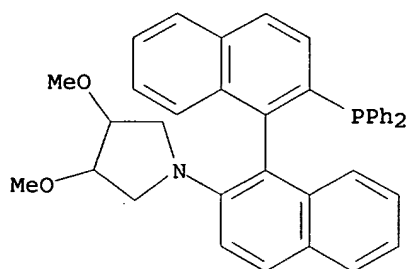


RN 413578-93-5 HCAPLUS  
 CN Pyrrolidine, 1-[(1S)-2'-(diphenylphosphino)[1,1'-binaphthalen]-2-yl]-  
 3,4-dimethoxy-, (3S,4S)- (9CI) (CA INDEX NAME)

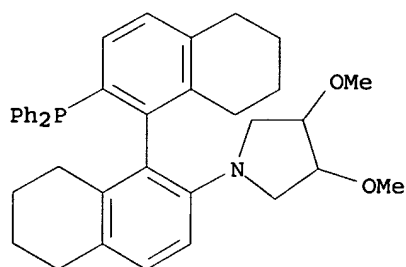




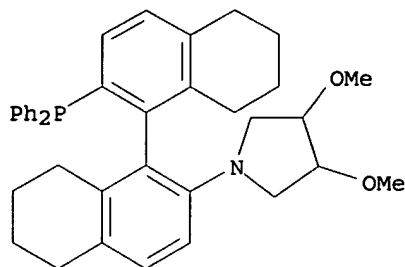
RN 413578-94-6 HCAPLUS  
 CN Pyrrolidine, 1-[(1R)-2'-(diphenylphosphino)[1,1'-binaphthalen]-2-yl]-3,4-dimethoxy-, (3S,4S)- (9CI) (CA INDEX NAME)



RN 413578-97-9 HCAPLUS  
 CN Pyrrolidine, 1-[(1S)-2'-(diphenylphosphino)-5,5',6,6',7,7',8,8'-octahydro[1,1'-binaphthalen]-2-yl]-3,4-dimethoxy-, (3S,4S)- (9CI) (CA INDEX NAME)



RN 413578-98-0 HCAPLUS  
 CN Pyrrolidine, 1-[(1R)-2'-(diphenylphosphino)-5,5',6,6',7,7',8,8'-octahydro[1,1'-binaphthalen]-2-yl]-3,4-dimethoxy-, (3S,4S)- (9CI) (CA INDEX NAME)



CC 25-24 (Benzene, Its Derivatives, and Condensed Benzenoid Compounds)  
 IT 413578-90-2P 413578-93-5P 413578-94-6P  
 413578-97-9P 413578-98-0P  
 RL: CAT (Catalyst use); SPN (Synthetic preparation);  
 PREP (Preparation); USES (Uses)  
 (prepn. of pyrrolidinylnaphthylidiphenylphosphine  
 chiral ligands for the addn. of malonate to  
 diphenylpropenyl acetate)

REFERENCE COUNT: 20 THERE ARE 20 CITED REFERENCES AVAILABLE  
 FOR THIS RECORD. ALL CITATIONS AVAILABLE  
 IN THE RE FORMAT

L26 ANSWER 32 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2001:904192 HCAPLUS

DOCUMENT NUMBER: 136:37771

TITLE: Preparation of chiral phosphine ligands and  
 corresponding ruthenium complexes as catalysts  
 for asymmetric hydrogenation

INVENTOR(S): Burk, Mark Joseph; Malan, Christophe Guillaume

PATENT ASSIGNEE(S): Chirotech Technology Limited, UK

SOURCE: PCT Int. Appl., 19 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 2

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001094359	A1	20011213	WO 2001-GB2467	20010604
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 EP 1299401 A1 20030409 EP 2001-936640 200106  
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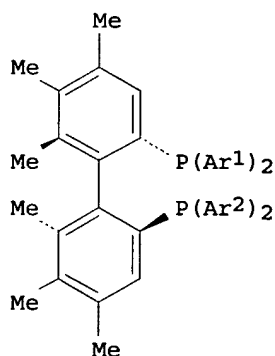
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GB 2000-18145 A 200007  
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GB 2001-1458 A 200101  
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WO 2001-GB2467 W 200106  
 04

OTHER SOURCE(S): CASREACT 136:37771; MARPAT 136:37771  
 GI



AB Novel phosphine ligands [I; Ar1, Ar2 = independently Ph, optionally substituted with one, two or more alkyl or alkoxy groups (e.g., p-tolyl, 3,5-dimethylphenyl, 4-methoxy-3,5-dimethylphenyl)] were prepd. Ruthenium complexes of these ligands are useful as catalysts in stereoselective hydrogenation. Thus, (R)-3,3',4,4',5,5'-hexamethyl-6,6'-bis-diphenylphosphonylbiphenyl ((R)-HexaPhemp) (synthetic prepn. given) is complexed with [Ru(benzene)Cl2]2 in the presence of (R,R)-diphenylethylenediamine (DPEN) to give (R)-HexaPhemp-RuCl2-(R,R)-DPEN (II). Complex II hydrogenates acetophenone in 86% ee.

IT 380383-25-5P 380383-26-6P 380383-27-7P  
 380383-30-2P 380383-31-3P 380383-32-4P

380383-34-6P 380394-53-6P 380394-54-7P

380394-55-8P 380394-56-9P 380394-59-2P

RL: CAT (Catalyst use); SPN (Synthetic preparation);

PREP (Preparation); USES (Uses)

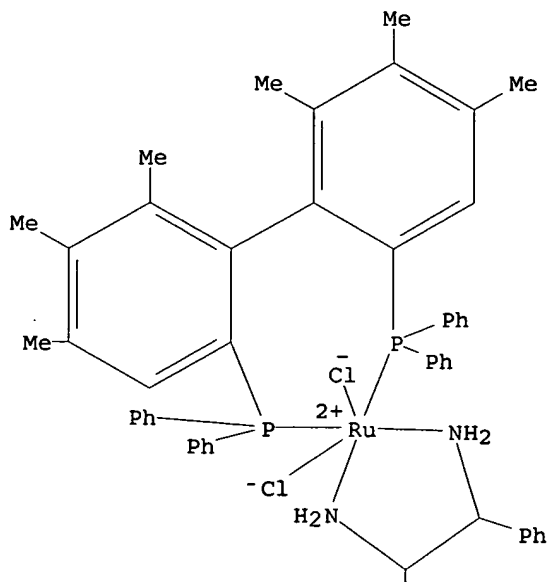
(prepn. of chiral phosphine ligands

and corresponding ruthenium complexes as catalysts for asym.  
hydrogenation)

RN 380383-25-5 HCAPLUS

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 $\kappa$ N, $\kappa$ N'] [[[1R]-4,4',5,5',6,6'-hexamethyl[1,1'-biphenyl]-  
2,2'-diyl]bis[diphenylphosphine- $\kappa$ P]]-, (OC-6-13)- (9CI) (CA  
INDEX NAME)

PAGE 1-A



PAGE 2-A



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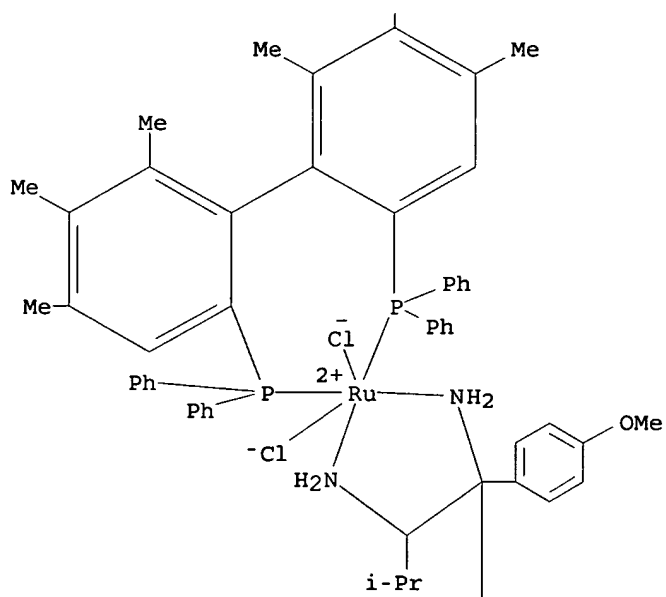
CN Ruthenium, [(2R)-1,1-bis(4-methoxyphenyl)-3-methyl-1,2-butanediamine-  
 $\kappa$ N, $\kappa$ N']dichloro[[[(1R)-4,4',5,5',6,6'-hexamethyl[1,1'-  
biphenyl]-2,2'-diyl]bis[diphenylphosphine- $\kappa$ P]]-, (OC-6-13)-  
(9CI) (CA INDEX NAME)

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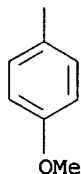
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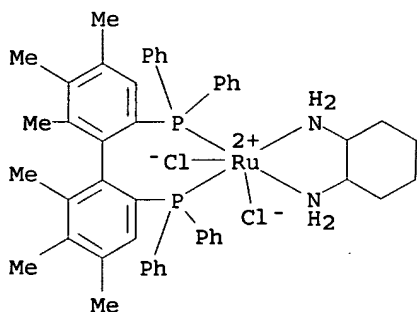
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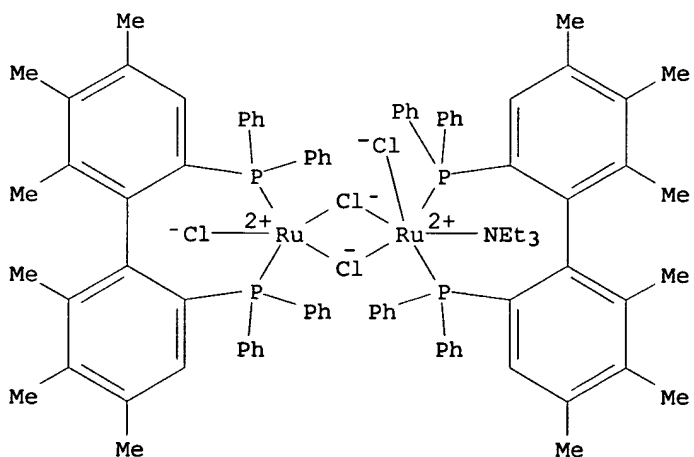
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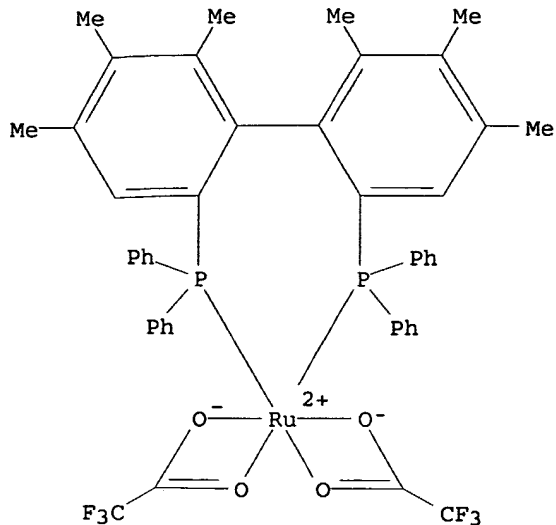
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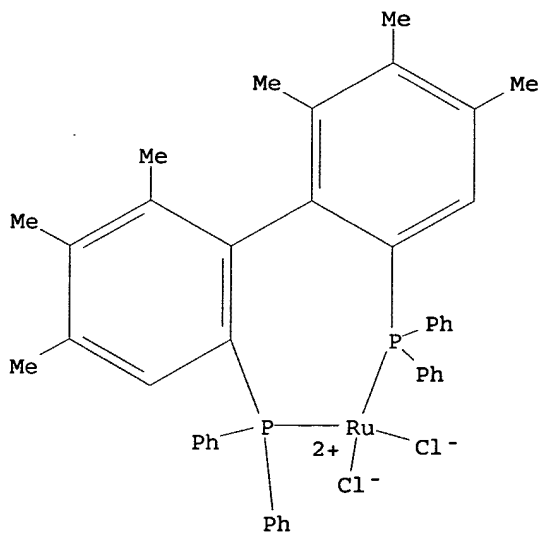
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 CN Ruthenium, di- $\mu$ -chlorodichloro(N,N-diethylethanamine)bis[(4,4',5,5',6,6'-hexamethyl[1,1'-biphenyl]-2,2'-diyl]bis[diphenylphosphine- $\kappa$ P]]di- (9CI) (CA INDEX NAME)



RN 380383-31-3 HCAPLUS  
 CN Ruthenium, [[[(1S)-4,4',5,5',6,6'-hexamethyl[1,1'-biphenyl]-2,2'-diyl]bis[diphenylphosphine- $\kappa$ P]]bis(trifluoroacetato- $\kappa$ O, $\kappa$ O')-, (OC-6-13)- (9CI) (CA INDEX NAME)



RN 380383-32-4 HCAPLUS  
 CN Ruthenium, dichloro[[[(1S)-4,4',5,5',6,6'-hexamethyl[1,1'-biphenyl]-2,2'-diyl]bis[diphenylphosphine-κP]]-, (SP-4-2)- (9CI) (CA INDEX NAME)

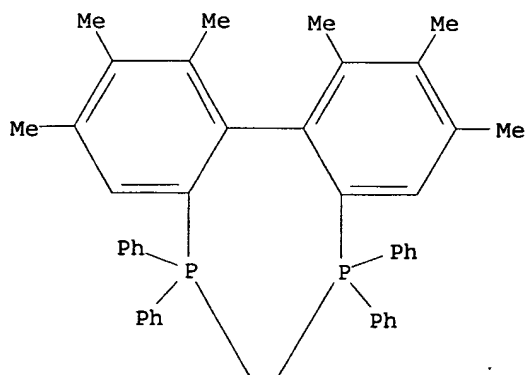


RN 380383-34-6 HCAPLUS  
 CN Rhodium(1+), [(1,2,5,6-η)-1,5-cyclooctadiene][[(1S)-4,4',5,5',6,6'-hexamethyl[1,1'-biphenyl]-2,2'-diyl]bis[diphenylphosphine-κP]]-, tetrafluoroborate(1-) (9CI) (CA INDEX NAME)

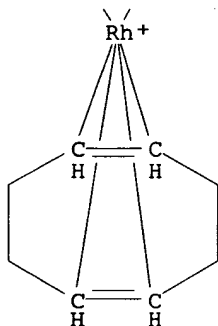
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PAGE 1-A



PAGE 2-A

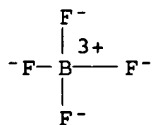


CM 2

CRN 14874-70-5

CMF B F4

CCI CCS

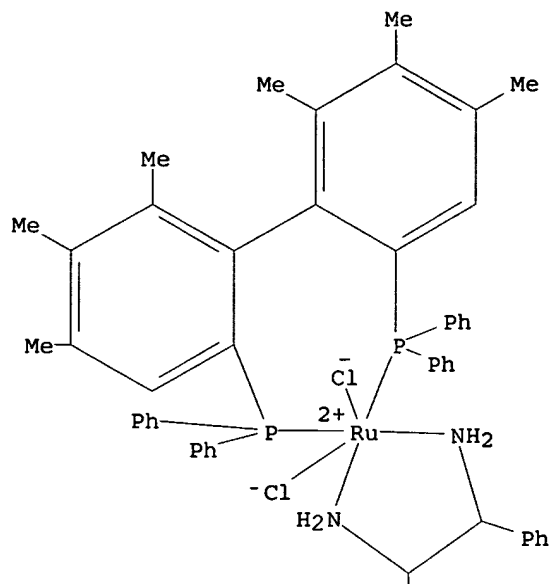


RN 380394-53-6 HCAPLUS

CN Ruthenium, dichloro[(1R,2R)-1,2-diphenyl-1,2-ethanediamine- $\kappa$ N, $\kappa$ N'][[[(1R)-4,4',5,5',6,6'-hexamethyl[1,1'-biphenyl]-2,2'-diyl]bis[diphenylphosphine- $\kappa$ P]]-, (OC-6-13)- (9CI) (CA INDEX NAME)



PAGE 1-A

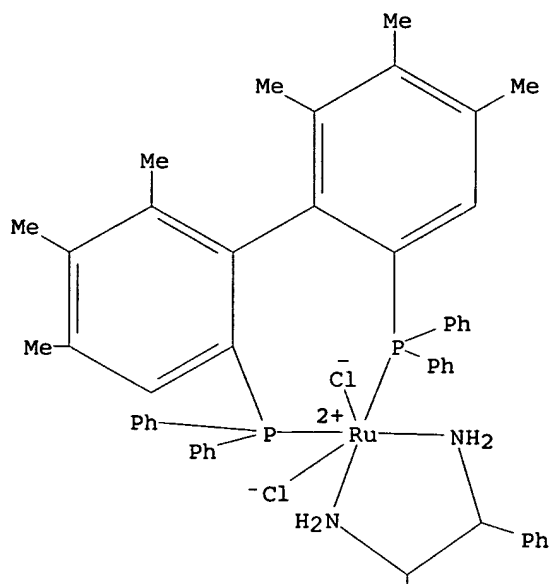


PAGE 2-A

Ph

RN 380394-54-7 HCAPLUS  
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PAGE 1-A

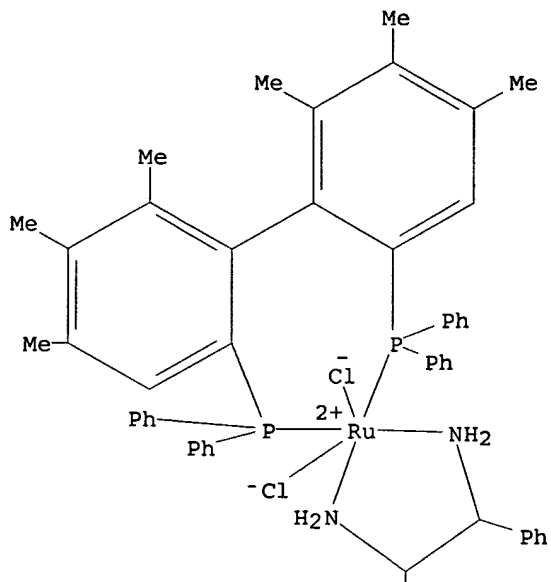


PAGE 2-A

|  
Ph

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 $\kappa$ N, $\kappa$ N'][[[(1S)-4,4',5,5',6,6'-hexamethyl[1,1'-biphenyl]-  
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 INDEX NAME)

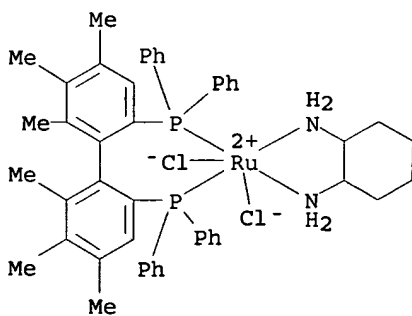
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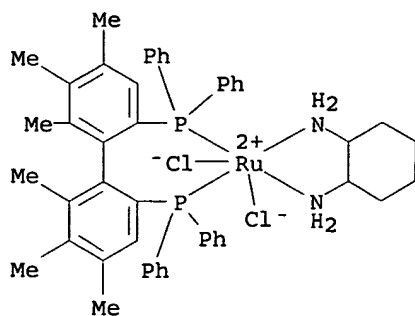
PAGE 2-A

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Ph

RN 380394-56-9 HCAPLUS  
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 $\kappa$ N, $\kappa$ N'] [[[1S]-4,4',5,5',6,6'-hexamethyl[1,1'-biphenyl]-  
 2,2'-diyl]bis[diphenylphosphine- $\kappa$ P]]-, (OC-6-13)- (9CI) (CA  
 INDEX NAME)



RN 380394-59-2 HCAPLUS  
 CN Ruthenium, dichloro[(1R,2R)-1,2-cyclohexanediamine-  
 $\kappa$ N, $\kappa$ N'] [[[1R]-4,4',5,5',6,6'-hexamethyl[1,1'-biphenyl]-  
 2,2'-diyl]bis[diphenylphosphine- $\kappa$ P]]-, (OC-6-13)- (9CI) (CA  
 INDEX NAME)



IC ICM C07F009-50  
ICS C07F015-00; C07B053-00; C07M007-00  
CC 29-7 (Organometallic and Organometalloidal  
Compounds)  
Section cross-reference(s): 67  
IT 380383-25-5P 380383-26-6P 380383-27-7P  
380383-30-2P 380383-31-3P 380383-32-4P  
380383-34-6P 380394-53-6P 380394-54-7P  
380394-55-8P 380394-56-9P 380394-59-2P  
RL: CAT (Catalyst use); SPN (Synthetic preparation);  
PREP (Preparation); USES (Uses)  
(prepn. of chiral phosphine ligands  
and corresponding ruthenium complexes as catalysts for asym.  
hydrogenation)

REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR  
THIS RECORD. ALL CITATIONS AVAILABLE IN  
THE RE FORMAT

L26 ANSWER 33 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2001:772171 HCAPLUS  
DOCUMENT NUMBER: 135:318588  
TITLE: Biaryl phosphine and amine ligands for improved  
transition metal-catalyzed processes  
INVENTOR(S): Buchwald, Stephen L.; Old, David W.; Wolfe, John  
P.; Palucki, Michael; Kamikawa, Ken  
PATENT ASSIGNEE(S): Massachusetts Institute of Technology, USA  
SOURCE: U.S., 55 pp., Cont.-in-part of U.S. Ser. No.  
113,478.  
CODEN: USXXAM  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 5  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6307087	B1	20011023	US 1999-231315	199901 13
US 6395916	B1	20020528	US 1998-113478	199807 10
CA 2336691	AA	20000120	CA 1999-2336691	199907 09
WO 2000002887	A2	20000120	WO 1999-US15450	199907

09  
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 WO 2000002887 A3 20000629  
 W: CA, JP  
 RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC,  
 NL, PT, SE  
 EP 1097158 A2 20010509 EP 1999-933785  
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 R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC,  
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 JP 2002520328 T2 20020709 JP 2000-559117  
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 EP 1354887 A1 20031022 EP 2003-9560  
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 AT 316532 E 20060215 AT 1999-933785  
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 US 2002156295 A1 20021024 US 2001-4101  
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 US 7026498 B2 20060411  
 US 2004010149 A1 20040115 US 2003-420950  
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 US 1998-196855 A  
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 US 1999-231315 A  
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 US 1999-239024 A  
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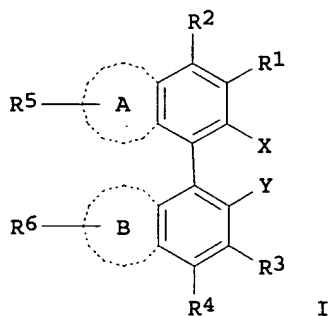
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US 2003-451562P P  
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US 2003-420950 A2  
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OTHER SOURCE(S): CASREACT 135:318588; MARPAT 135:318588  
GI



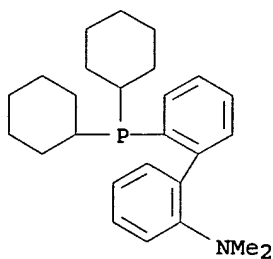
AB The present invention relates to the **prepn.** of novel biaryl **phosphine** and amine **ligands** (I) [wherein A and B = independently fused monocyclic or polycyclic cycloalkyl, cycloalkenyl, aryl, or heterocyclic rings of 4-8 atoms; X = NR<sub>2</sub>, PR<sub>2</sub>, AsR<sub>2</sub>, OR, or SR; Y = NR<sub>2</sub>, PR<sub>2</sub>, AsR<sub>2</sub>, OR, SR, SiR<sub>3</sub>, alkyl, or H; R-R<sub>6</sub> = independently H, halogen, (hetero)alkyl, alkenyl, alkynyl, hydroxy, alkoxy, silyloxy, amino, nitro, sulfhydryl, amide, carbonyl, ketone, anhydride, silyl, thioalkyl, ketone, ester, nitrile, (hetero)aryl, etc.] for **transition metals** and their use in **metal**-catalyzed carbon-heteroatom and carbon-carbon bond-forming reactions. Unexpected improvements over the prior art were demonstrated in **transition metal**-catalyzed aryl amination reactions, Suzuki couplings giving both biaryl and alkylaryl products, arylations and vinylations at the position  $\alpha$  to carbonyl groups, and carbon-oxygen bond formation. The **ligands** and methods of the invention enable transformations utilizing aryl chlorides and bromides at room temp. at synthetically useful rates with extremely small amts. of catalyst relative to the limiting reagent. For example, coupling of p-chlorobenzonitrile and morpholine was catalyzed by 2.5 mol% Pd<sub>2</sub>(dba)<sub>3</sub>, 7.5 mol% of 2-(N,N-dimethylamino)-2'-(dicyclohexylphosphino)biphenyl, and NaOBu-t in DME at room temp. to provide 4-(4-morpholinyl)benzonitrile in 96% yield. Thus, the subject processes provide improvements in many features of the **transition metal**-catalyzed reactions, including the range of suitable substrates, reaction conditions, and efficiency.

IT 213697-53-1P 224311-51-7P, 2-(Di-tert-

butylphosphino)biphenyl 255835-81-5P 255835-82-6P  
 RL: CAT (Catalyst use); IMF (Industrial manufacture); SPN  
 (Synthetic preparation); PREP (Preparation); USES (Uses)  
 (biaryl phosphine and amine ligands for improved transition  
 metal-catalyzed processes)

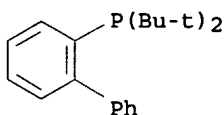
RN 213697-53-1 HCAPLUS

CN [1,1'-Biphenyl]-2-amine, 2'-(dicyclohexylphosphino)-N,N-dimethyl-  
 (9CI) (CA INDEX NAME)



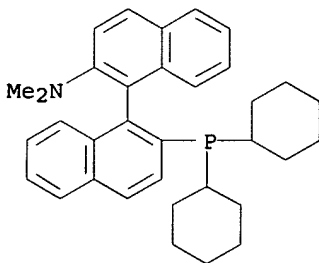
RN 224311-51-7 HCAPLUS

CN Phosphine, [1,1'-biphenyl]-2-ylbis(1,1-dimethylethyl)- (9CI) (CA  
 INDEX NAME)



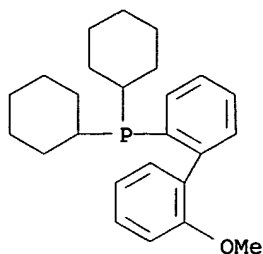
RN 255835-81-5 HCAPLUS

CN [1,1'-Binaphthalen]-2-amine, 2'-(dicyclohexylphosphino)-N,N-dimethyl-  
 (9CI) (CA INDEX NAME)

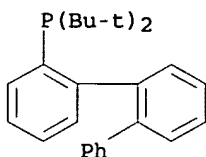


RN 255835-82-6 HCAPLUS

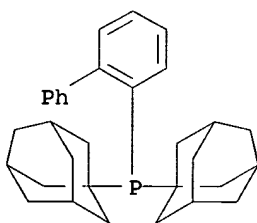
CN Phosphine, dicyclohexyl(2'-methoxy[1,1'-biphenyl]-2-yl)- (9CI) (CA  
 INDEX NAME)



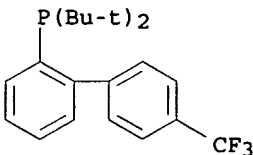
IT 224311-54-0P 224311-55-1P 255835-83-7P,  
 2(Di-t-butylphosphino)-4'-(trifluoromethyl)biphenyl  
 255835-84-8P 255882-14-5P  
 RL: IMF (Industrial manufacture); SPN (Synthetic preparation);  
 PREP (Preparation)  
 (biaryl phosphine and amine ligands for improved transition  
 metal-catalyzed processes)  
 RN 224311-54-0 HCAPLUS  
 CN Phosphine, bis(1,1-dimethylethyl) [1,1':2',1''-terphenyl]-2-yl- (9CI)  
 (CA INDEX NAME)



RN 224311-55-1 HCAPLUS  
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 (9CI) (CA INDEX NAME)

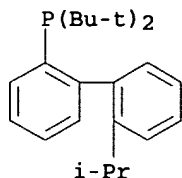


RN 255835-83-7 HCAPLUS  
 CN Phosphine, bis(1,1-dimethylethyl) [4'-(trifluoromethyl) [1,1'-  
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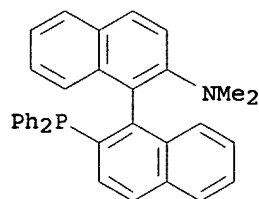


RN 255835-84-8 HCAPLUS  
 CN Phosphine, bis(1,1-dimethylethyl) [2'-(1-methylethyl) [1,1'-biphenyl]-  
 2-yl]- (9CI) (CA INDEX NAME)





RN 255882-14-5 HCAPLUS  
 CN [1,1'-Binaphthalen]-2-amine, 2'-(diphenylphosphino)-N,N-dimethyl-  
 (9CI) (CA INDEX NAME)



IC ICM C07C255-03  
 ICS C07F009-28; C07D265-30; C07D211-70; C07D209-04  
 INCL 558388000  
 CC 29-7 (Organometallic and Organometalloidal Compounds)  
 Section cross-reference(s): 25  
 ST biaryl phosphine amine ligand prepn  
 transition metal catalyst; amination aryl chloride  
 bromide palladium catalysts; Suzuki coupling aryl chloride bromide  
 palladium catalysts; ketone arylation palladium catalysts  
 IT Amines, preparation  
 RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP  
 (Preparation); USES (Uses)  
 (arom.; biaryl phosphine and amine ligands  
 for improved transition metal-catalyzed  
 processes)  
 IT Ketones, preparation  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (arom.; biaryl phosphine and amine ligands  
 for improved transition metal-catalyzed  
 processes)  
 IT Phosphines  
 RL: CAT (Catalyst use); USES (Uses)  
 (biaryl phosphine and amine ligands for improved transition  
 metal-catalyzed processes)  
 IT Biaryls  
 RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP  
 (Preparation); USES (Uses)  
 (biaryl phosphine and amine ligands for improved transition  
 metal-catalyzed processes)  
 IT Transition metal complexes  
 RL: CAT (Catalyst use); USES (Uses)  
 (phosphine; biaryl phosphine and amine ligands for improved  
 transition metal-catalyzed processes)  
 IT Phosphines  
 RL: CAT (Catalyst use); USES (Uses)  
 (transition metal complexes; biaryl phosphine and amine ligands  
 for improved transition metal-catalyzed processes)  
 IT 127-09-3, Sodium acetate 534-17-8 584-08-7, Potassium carbonate  
 3375-31-3, Palladium diacetate 6476-37-5,  
 Dicyclohexylphenylphosphine 7778-53-2 7789-23-3, Potassium  
 fluoride 13400-13-0, Cesium fluoride 14221-01-3,

Tetrakis(triphenylphosphine)palladium 51364-51-3,  
 Tris(dibenzylideneacetone)dipalladium 54000-83-8,  
 2,6-Dimethoxyphenyl-di-t-butylphosphine 166330-10-5 213774-71-1  
 255837-14-0, 2,4,6-Trimethoxyphenyl-di-t-butylphosphine

RL: CAT (Catalyst use); USES (Uses)

(biaryl phosphine and amine ligands for improved transition  
 metal-catalyzed processes)

IT 213697-53-1P 224311-51-7P, 2-(Di-tert-  
 butylphosphino)biphenyl 255835-81-5P 255835-82-6P  
 RL: CAT (Catalyst use); IMF (Industrial manufacture); SPN  
 (Synthetic preparation); PREP (Preparation); USES (Uses)  
 (biaryl phosphine and amine ligands for improved transition  
 metal-catalyzed processes)

IT 92-69-3P, 4-Hydroxybiphenyl 92-91-1P, 4-Acetylbiphenyl 92-93-3P,  
 4-Nitrobiphenyl 612-75-9P, 3,3'-Dimethylbiphenyl 613-37-6P  
 644-08-6P 720-75-2P 825-55-8P, 2-Phenylthiophene 2142-66-7P,  
 2-Acetylbiphenyl 2920-38-9P, 4-Cyanobiphenyl 2928-43-0P,  
 2-Hydroxymethylbiphenyl 3976-34-9P, 2,6-Dimethylbiphenyl  
 4075-79-0P, n-Acetyl-4-aminobiphenyl 5405-15-2P 7372-85-2P,  
 2,5-Dimethylbiphenyl 10282-31-2P 17057-88-4P 19853-10-2P,  
 [1,1'-Biphenyl]-2-acetonitrile 23676-05-3P 31144-33-9P  
 39253-43-5P 39910-98-0P, n-(4-Acetylphenyl)morpholine  
 54660-04-7P, n-(4-Methoxyphenyl)pyrrolidine 76650-29-8P  
 76708-78-6P 81693-80-3P 82749-62-0P 92495-53-9P  
 138900-16-0P, N-(4-Fluorophenyl)indole 167283-32-1P,  
 N-(4-Methylphenyl)indole 171092-38-9P, 3-(3-Acetylphenyl)pyridine  
 174307-96-1P 180336-54-3P, N-(2,5-Dimethylphenyl)-N-methylaniline  
 197172-67-1P 213697-51-9P, n-(2,5-Dimethylphenyl)morpholine  
 213697-52-0P 213697-65-5P 213697-66-6P 224311-54-0P  
 224311-55-1P 251320-77-1P 251320-78-2P 251320-81-7P,  
 3-Acetyl-3',5'-dimethoxybiphenyl 251320-82-8P,  
 4-Carbomethoxy-3'-acetylbiphenyl 251320-84-0P 255835-83-7P  
 , 2-(Di-t-butylphosphino)-4'-(trifluoromethyl)biphenyl  
 255835-84-8P 255835-85-9P 255882-14-5P  
 RL: IMF (Industrial manufacture); SPN (Synthetic preparation);  
 PREP (Preparation)

(biaryl phosphine and amine ligands for improved transition  
 metal-catalyzed processes)

REFERENCE COUNT: 131 THERE ARE 131 CITED REFERENCES AVAILABLE  
 FOR THIS RECORD. ALL CITATIONS AVAILABLE  
 IN THE RE FORMAT

L26 ANSWER 34 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2001:462837 HCAPLUS

DOCUMENT NUMBER: 135:288825

TITLE: Palladium-catalyzed asymmetric allylic  
 alkylation in the presence of a chiral 'light  
 fluorous' phosphine ligand

AUTHOR(S): Cavazzini, Marco; Pozzi, Gianluca; Quici,  
 Silvio; Maillard, David; Sinou, Denis

CORPORATE SOURCE: Centro CNR Sintesi e Stereochimica di Speciali  
 Sistemi Organici, Milan, 20133, Italy

SOURCE: Chemical Communications (Cambridge, United  
 Kingdom) (2001), (13), 1220-1221

CODEN: CHCOFS; ISSN: 1359-7345

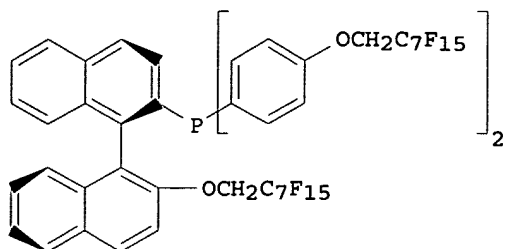
PUBLISHER: Royal Society of Chemistry

DOCUMENT TYPE: Journal

LANGUAGE: English

OTHER SOURCE(S): CASREACT 135:288825

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AB The easily accessible, enantiopure (R)-(+)-2-diarylphosphino-2'-alkoxy-1,1'-binaphthyl I bearing three fluorous ponytails is an efficient ligand in the palladium-catalyzed asym. allylic substitution of 1,3-diphenylprop-2-enyl acetate affording chiral products of up to 87% ee.

IT 365240-77-3P

RL: CAT (Catalyst use); SPN (Synthetic preparation);

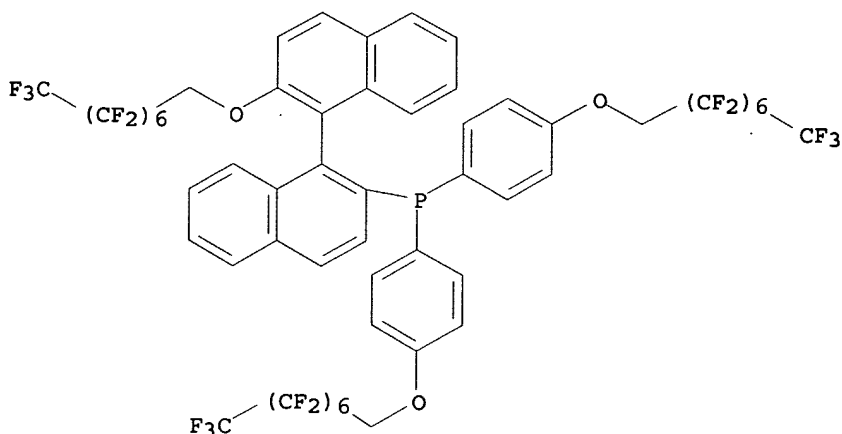
PREP (Preparation); USES (Uses)

(prepn. of chiral light fluorous phosphine

ligand for palladium-catalyzed asym. allylic alkylation)

RN 365240-77-3 HCAPLUS

CN Phosphine, [(1R)-2'-[(2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluorooctyl)oxy][1,1'-binaphthalen]-2-yl]bis[4-[(2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluorooctyl)oxy]phenyl]-(9CI) (CA INDEX NAME)



CC 29-7 (Organometallic and Organometalloidal Compounds)

Section cross-reference(s): 25

IT 365240-77-3P

RL: CAT (Catalyst use); SPN (Synthetic preparation);

PREP (Preparation); USES (Uses)

(prepn. of chiral light fluorous phosphine

ligand for palladium-catalyzed asym. allylic alkylation)

REFERENCE COUNT: 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L26 ANSWER 35 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN

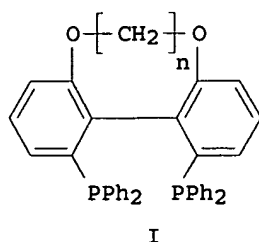
ACCESSION NUMBER: 2001:228894 HCAPLUS

DOCUMENT NUMBER: 134:266437

TITLE: Chiral phosphines, transition metal complexes

thereof and uses thereof in asymmetric reactions  
 INVENTOR(S): Zhang, Xumu  
 PATENT ASSIGNEE(S): Penn State Research Foundation, USA  
 SOURCE: PCT Int. Appl., 52 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001021625	A1	20010329	WO 2000-US25635	20000919
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
CA 2385421	AA	20010329	CA 2000-2385421	20000919
EP 1214328	A1	20020619	EP 2000-965136	20000919
EP 1214328	B1	20060503		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL				
US 6521769	B1	20030218	US 2000-665456	20000919
JP 2003509513	T2	20030311	JP 2001-525000	20000919
PRIORITY APPLN. INFO.:				
			US 1999-154845P	P 19990920
			WO 2000-US25635	W 20000919
OTHER SOURCE(S):				
GI	CASREACT 134:266437; MARPAT 134:266437			



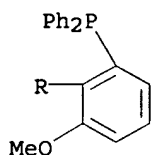
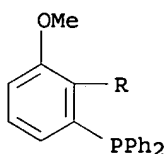
AB Chiral ligands and transition metal complexes based on such chiral ligands useful in asym. catalysis are disclosed. The chiral ligands include chiral C1-C6-TunaPhos ligands I (n = 1-6). The ruthenium TunaPhos complex reduces ketones to the corresponding alcs. with 95-99.6 % enantioselectivity. The transition metal complexes of the chiral ligands are useful in asym. reactions such as asym. hydrogenation, hydride transfer, hydrosilylation, hydroboration, hydrovinylation, hydroformylation, hydrocarboxylation, isomerization, allylic alkylation, cyclopropanation, Diels-Alder reaction, Heck reaction, isomerization, Aldol reaction, Michael addn. and epoxidn. reactions.

IT 133545-16-1P, (R)-MeO-BIPHEP

RL: CAT (Catalyst use); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)  
(as free ligand and as dendrimer core; **prepn.**  
as chiral **diphosphine** cocatalyst in **transition**  
**metal** complex catalyzed asym. reactions and demethylation  
of)

RN 133545-16-1 HCAPLUS

CN Phosphine, [(1R)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[diphenyl- (9CI) (CA INDEX NAME)

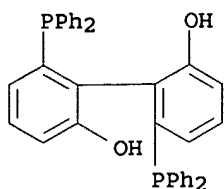


IT 151395-61-8P, (R)-HO-BIPHEP

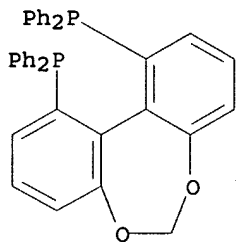
RL: RCT (Reactant); SPN (Synthetic preparation); **PREP**  
(**Preparation**); RACT (Reactant or reagent)  
(**prepn.** and cyclization with organo dihalide)

RN 151395-61-8 HCAPLUS

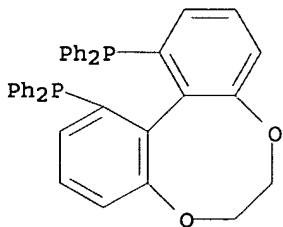
CN [1,1'-Biphenyl]-2,2'-diol, 6,6'-bis(diphenylphosphino)-, (1R)- (9CI)  
(CA INDEX NAME)



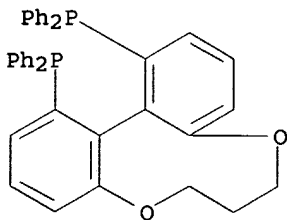
IT 301847-87-0P, (R)-C1-TunaPhos 301847-88-1P,  
 (R)-C2-TunaPhos 301847-89-2P, (R)-C3-TunaPhos  
 301847-90-5P, (R)-C4-TunaPhos 301847-91-6P,  
 (R)-C5-TunaPhos 301847-92-7P, (R)-C6-TunaPhos  
 RL: CAT (Catalyst use); SPN (Synthetic preparation);  
 PREP (Preparation); USES (Uses)  
 (prepn. as cocatalyst in transition metal complex catalyzed asym.  
 reactions)  
 RN 301847-87-0 HCAPLUS  
 CN Phosphine, (11aR)-dibenzo[d,f][1,3]dioxepin-1,11-diylbis[diphenyl-  
 (9CI) (CA INDEX NAME)



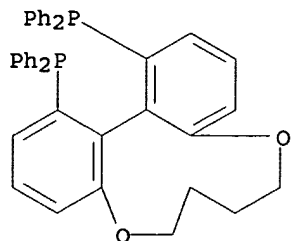
RN 301847-88-1 HCAPLUS  
 CN Phosphine, [(12aR)-6,7-dihydrodibenzo[e,g][1,4]dioxocin-1,12-  
 diyl]bis[diphenyl- (9CI) (CA INDEX NAME)



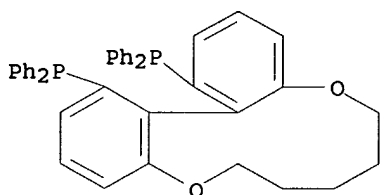
RN 301847-89-2 HCAPLUS  
 CN Phosphine, [(13aR)-7,8-dihydro-6H-dibenzo[f,h][1,5]dioxonin-1,13-  
 diyl]bis[diphenyl- (9CI) (CA INDEX NAME)



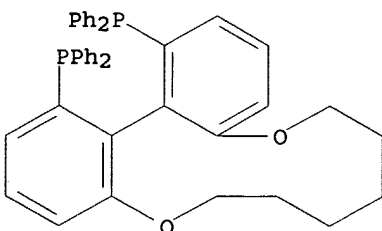
RN 301847-90-5 HCAPLUS  
 CN Phosphine, [(14aR)-6,7,8,9-tetrahydrodibenzo[b,d][1,6]dioxecin-1,14-diyl]bis[diphenyl- (9CI) (CA INDEX NAME)]



RN 301847-91-6 HCAPLUS  
 CN Phosphine, [(15aR)-7,8,9,10-tetrahydro-6H-dibenzo[b,d][1,6]dioxacycloundecin-1,15-diyl]bis[diphenyl- (9CI) (CA INDEX NAME)]



RN 301847-92-7 HCAPLUS  
 CN Phosphine, [(16aR)-6,7,8,9,10,11-hexahydrodibenzo[b,d][1,6]dioxacyclododecin-1,16-diyl]bis[diphenyl- (9CI) (CA INDEX NAME)]



IC ICM C07F009-02  
 ICS C07F009-52; C07F015-00; B01J031-00  
 CC 29-7 (**Organometallic and Organometalloidal**  
 Compounds)  
 Section cross-reference(s): 21, 35, 67  
 IT Polyethers, preparation  
 RL: **CAT (Catalyst use)**; SPN (Synthetic preparation); PREP  
 (Preparation); USES (Uses)  
 (dendrimers; prepn. of dendritic chiral diphosphines as  
 cocatalyst in transition metal complex catalyzed asym. reactions)  
 IT Dendritic polymers  
 RL: **CAT (Catalyst use)**; SPN (Synthetic preparation); PREP  
 (Preparation); USES (Uses)  
 (polyethers; prepn. of dendritic chiral diphosphines as  
 cocatalyst in transition metal complex catalyzed asym. reactions)  
 IT Polyamides, uses

- Vanadyl complexes  
 RL: **CAT (Catalyst use)**; **USES (Uses)**  
 (prepn. of chiral diphosphines as cocatalyst in transition metal complex catalyzed asym. reactions)
- IT Phosphines  
 RL: **CAT (Catalyst use)**; **SPN (Synthetic preparation)**; **PREP (Preparation)**; **USES (Uses)**  
 (prepn. of chiral diphosphines as cocatalyst in transition metal complex catalyzed asym. reactions)
- IT Zeolites (synthetic), uses  
 RL: **CAT (Catalyst use)**; **USES (Uses)**  
 (support; prepn. of chiral diphosphines as cocatalyst in transition metal complex catalyzed asym. reactions)
- IT 133545-16-1P, (R)-MeO-BIPHEP  
 RL: **CAT (Catalyst use)**; **RCT (Reactant)**; **SPN (Synthetic preparation)**; **PREP (Preparation)**; **RACT (Reactant or reagent)**; **USES (Uses)**  
 (as free ligand and as dendrimer core; prepn. as chiral diphosphine cocatalyst in transition metal complex catalyzed asym. reactions and demethylation of)
- IT 331769-02-9  
 RL: **CAT (Catalyst use)**; **USES (Uses)**  
 (as free ligand and as dendrimer core; prepn. of chiral diphosphines as cocatalyst in transition metal complex catalyzed asym. reactions)
- IT 331768-93-5  
 RL: **CAT (Catalyst use)**; **USES (Uses)**  
 (as free ligand and dendrimer core; prepn. of chiral diphosphines as cocatalyst in transition metal complex catalyzed asym. reactions)
- IT 76189-55-4  
 RL: **CAT (Catalyst use)**; **USES (Uses)**  
 (cocatalyst; chiral diphosphines as cocatalyst in transition metal complex catalyzed asym. reactions)
- IT 331754-83-7D, Me ether-terminated  
 RL: **CAT (Catalyst use)**; **USES (Uses)**  
 (dendrimers with (R)-((6,6'-diamino- or 6,6'-dihydroxybiphenyl-2,2'-diyl)bis(diphenylphosphine) as core; prepn. of chiral diphosphines as cocatalyst in transition metal complex catalyzed asym. reactions)
- IT 129371-31-9D, Poly(3,5-dihydroxybenzyl alcohol), Me ether-terminated  
 RL: **CAT (Catalyst use)**; **USES (Uses)**  
 (dendrimers with (R)-(6,6'-dihydroxy- or 6,6'-dicarboxybiphenyl-2,2'-diyl)bis(diphenylphosphine) as core; prepn. of chiral diphosphines as cocatalyst in transition metal complex catalyzed asym. reactions)
- IT 151395-61-8P, (R)-HO-BIPHEP  
 RL: **RCT (Reactant)**; **SPN (Synthetic preparation)**; **PREP (Preparation)**; **RACT (Reactant or reagent)**  
 (prepn. and cyclization with organo dihalide)
- IT 301847-87-0P, (R)-C1-TunaPhos 301847-88-1P, (R)-C2-TunaPhos 301847-89-2P, (R)-C3-TunaPhos 301847-90-5P, (R)-C4-TunaPhos 301847-91-6P, (R)-C5-TunaPhos 301847-92-7P, (R)-C6-TunaPhos  
 RL: **CAT (Catalyst use)**; **SPN (Synthetic preparation)**; **PREP (Preparation)**; **USES (Uses)**  
 (prepn. as cocatalyst in transition metal complex catalyzed asym. reactions)
- IT 546-68-9, Titanium(IV) isopropoxide 1295-35-8, Bis(cyclooctadiene)nickel 3153-26-2 3375-31-3, Palladium diacetate 10025-65-7, Platinum dichloride 12012-95-2, Bis[(η<sup>3</sup>-allyl)chloropalladium] 12082-47-2, Bis(ethylene)rhodium acetylacetonate 12092-47-6, Di-μ-chlorobis(cyclooctadiene)dirhodium 12112-67-3,



Dichlorobis(cyclooctadiene)diiridium 12289-94-0,  
 (1,5-Cyclooctadiene)bis(2-methylallyl)ruthenium 14024-58-9,  
 Manganese(II) acetylacetonate 14874-82-9, Dicarboxylrhodium  
 acetylacetonate 15244-77-6, Dicarboxyldichlororhodium  
 17524-05-9, Molybdenum dioxidiacetylacetonate 34946-82-2, Cupric  
 triflate 37366-09-9, Bis[( $\eta$ 6-benzene)dichlororuthenium]  
 42152-44-3, Cuprous triflate 50982-12-2,  
 Dichloro(cyclooctadiene)ruthenium 51364-51-3,  
 Tris(dibenzylideneacetone)dipalladium 70197-13-6, Methylrhodium  
 trioxide 331754-81-5 331754-82-6 331754-84-8 331768-59-3  
 331768-60-6 331768-61-7 331768-62-8 331768-63-9 331768-64-0  
 331768-65-1 331768-66-2 331768-67-3 331768-68-4 331768-69-5  
 331768-70-8 331768-71-9 331768-72-0 331768-73-1 331768-74-2  
 331768-75-3 331768-76-4 331768-77-5 331768-78-6 331768-80-0  
 331768-82-2 331768-83-3 331768-84-4 331768-85-5 331768-86-6  
 331768-87-7 331768-88-8 331768-89-9 331768-90-2 331768-91-3  
 331768-92-4 331768-94-6 331768-95-7 331768-95-7D, reaction  
 products with zeolites, silica, or mesoporous materials  
 331768-96-8 331768-97-9 331768-98-0 331768-99-1 331769-00-7  
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 331769-45-0 331769-46-1 331769-47-2 331769-48-3 331769-49-4  
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 331770-00-4D, reaction products with zeolites, silica, or mesoporous  
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 331770-20-8 331776-92-2

RL: CAT (Catalyst use); USES (Uses)

(prepn. of chiral diphosphines as cocatalyst in transition metal  
 complex catalyzed asym. reactions)

IT 7631-86-9, Silica, uses

RL: CAT (Catalyst use); USES (Uses)

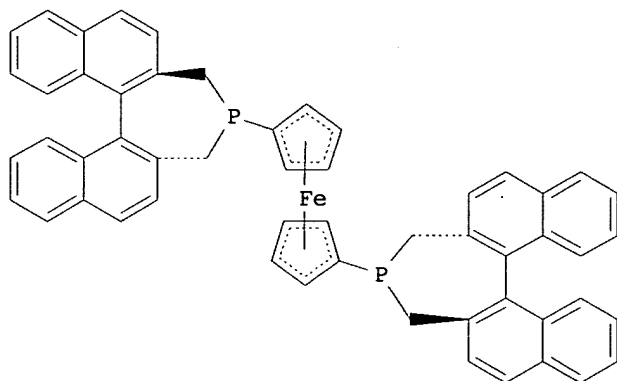
(support; prepn. of chiral diphosphines as cocatalyst in  
transition metal complex catalyzed asym. reactions)  
REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR  
THIS RECORD. ALL CITATIONS AVAILABLE IN  
THE RE FORMAT

L26 ANSWER 36 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2001:152619 HCAPLUS  
DOCUMENT NUMBER: 134:207966  
TITLE: Chiral ligands, transition-metal complexes  
thereof and uses thereof in asymmetric reactions  
INVENTOR(S): Zhang, Xumu; Xiao, Dengming  
PATENT ASSIGNEE(S): The Penn State Research Foundation, USA  
SOURCE: PCT Int. Appl., 69 pp.  
CODEN: PIXXD2  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001014299	A1	20010301	WO 2000-US22976	200008 22
<p>W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW</p> <p>RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG</p>				
CA 2382779	AA	20010301	CA 2000-2382779	200008 22
EP 1206427	A1	20020522	EP 2000-961346	200008 22
EP 1206427	B1	20051109		
<p>R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL</p>				
JP 2003507443	T2	20030225	JP 2001-518392	200008 22
US 6525210	B1	20030225	US 2000-643434	200008 22
AT 309186	E	20051115	AT 2000-961346	200008 22
US 2003163003	A1	20030828	US 2002-319093	200212 13
US 6828271	B2	20041207		
PRIORITY APPLN. INFO.:			US 1999-150375P	P 199908

23  
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 US 1999-165649P P 199911  
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 US 2000-643434 A3 200008  
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 WO 2000-US22976 W 200008  
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OTHER SOURCE(S): CASREACT 134:207966; MARPAT 134:207966  
 GI



I

AB Chiral ligands and transition metal complexes based on such chiral ligands useful in asym. catalysis are disclosed. The chiral ligands include phospholanes, P,N ligands, N,N ligands, biphenols, and chelating phosphines, e.g. I. The ferrocene-based iridium (R,R)-f-binaphane complex reduces imines to the corresponding amines with 95-99.6 % enantioselectivity and reduces  $\beta$ -substituted- $\alpha$ -arylenamides with 95 % enantioselectivity. The transition metal complexes of the chiral ligands are useful in asym. reactions such as asym. hydrogenation of imines, asym. hydride transfer reactions, hydrosilylation, hydroboration, hydrovinylation, hydroformylation, allylic alkylation, cyclopropanation, Diels-Alder reaction, Heck reaction, isomerization, Aldol reaction, Michael addn. and epoxidn. reactions.

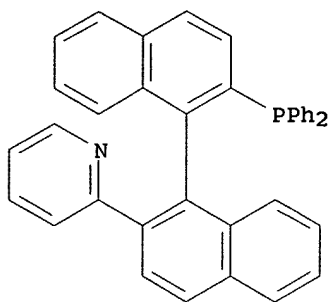
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 328387-10-6P 328387-11-7P 328387-12-8P  
 328387-13-9P 328387-14-0P 328387-34-4P  
 328387-36-6P 328387-38-8P 328387-41-3P  
 328387-43-5P 328387-44-6P

RL: CAT (Catalyst use); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)

(prepn. of chiral diphosphine ligands  
 and their transition-metal complexes as  
 catalysts for asym. reactions)

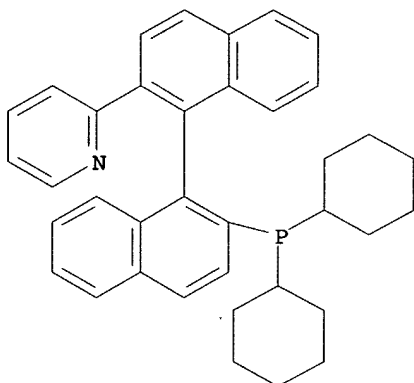
RN 328387-04-8 HCAPLUS

CN Pyridine, 2-[(1R)-2'-(diphenylphosphino)[1,1'-binaphthalen]-2-yl]-  
(9CI) (CA INDEX NAME)



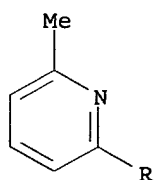
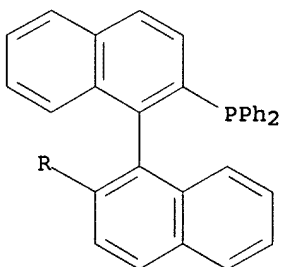
RN 328387-05-9 HCAPLUS

CN Pyridine, 2-[(1R)-2'-(dicyclohexylphosphino)[1,1'-binaphthalen]-2-yl]-  
(9CI) (CA INDEX NAME)

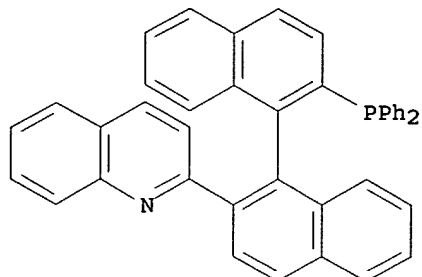


RN 328387-06-0 HCAPLUS

CN Pyridine, 2-[(1R)-2'-(diphenylphosphino)[1,1'-binaphthalen]-2-yl]-6-  
methyl- (9CI) (CA INDEX NAME)

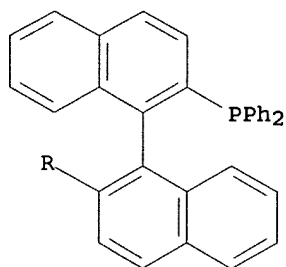


RN 328387-07-1 HCAPLUS  
CN Quinoline, 2-[(1R)-2'-(diphenylphosphino)[1,1'-binaphthalen]-2-yl]-  
(9CI) (CA INDEX NAME)

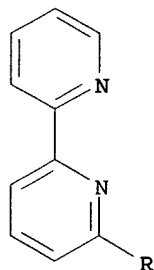


RN 328387-08-2 HCAPLUS  
CN 2,2'-Bipyridine, 6-[(1R)-2'-(diphenylphosphino)[1,1'-binaphthalen]-2-yl]- (9CI) (CA INDEX NAME)

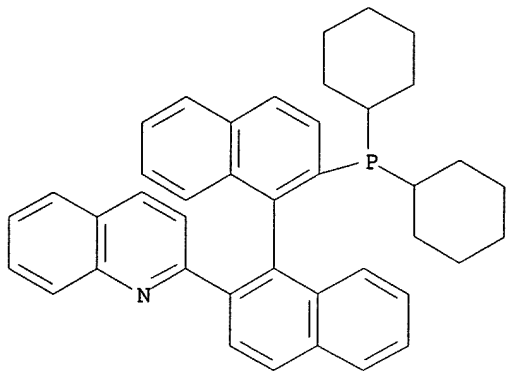
PAGE 1-A



PAGE 2-A

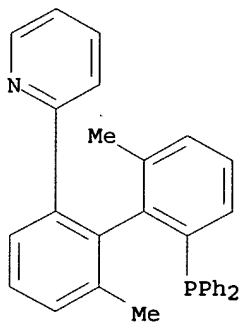


RN 328387-09-3 HCAPLUS  
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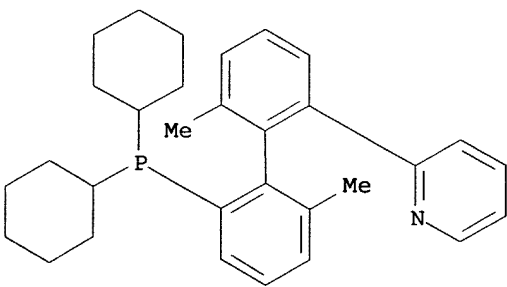
RN 328387-10-6 HCAPLUS

CN Pyridine, 2-[(1R)-2'-(diphenylphosphino)-6,6'-dimethyl[1,1'-biphenyl]-2-yl]- (9CI) (CA INDEX NAME)



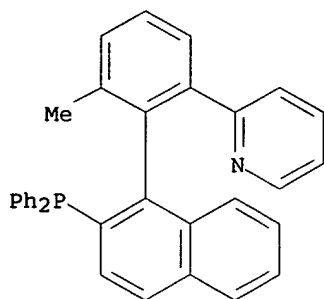
RN 328387-11-7 HCAPLUS

CN Pyridine, 2-[(1R)-2'-(dicyclohexylphosphino)-6,6'-dimethyl[1,1'-biphenyl]-2-yl]- (9CI) (CA INDEX NAME)



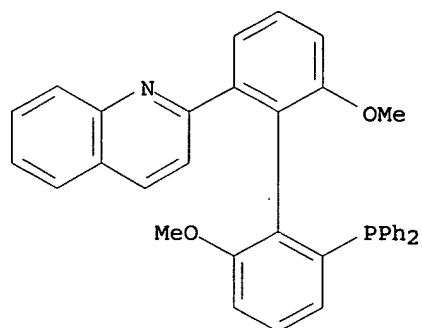
RN 328387-12-8 HCAPLUS

CN Pyridine, 2-[(2R)-2-[2-(diphenylphosphino)-1-naphthalenyl]-3-methylphenyl]- (9CI) (CA INDEX NAME)



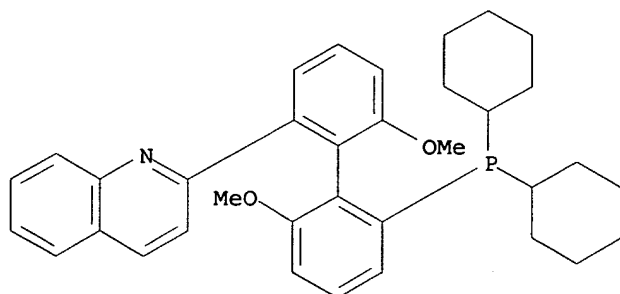
RN 328387-13-9 HCAPLUS

CN Quinoline, 2-[(1R)-2'-(diphenylphosphino)-6,6'-dimethoxy[1,1'-biphenyl]-2-yl]- (9CI) (CA INDEX NAME)



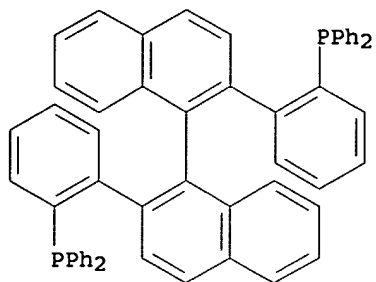
RN 328387-14-0 HCAPLUS

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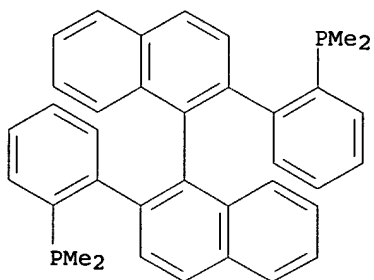


RN 328387-34-4 HCAPLUS

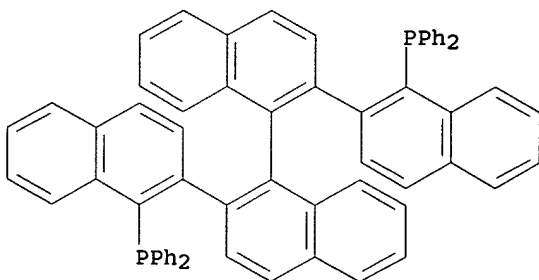
CN Phosphine, [(1R)-[1,1'-binaphthalene]-2,2'-diyl]-2,1-phenylene]bis(diphenyl)- (9CI) (CA INDEX NAME)



RN 328387-36-6 HCAPLUS  
 CN Phosphine, [(1R)-[1,1'-binaphthalene]-2,2'-diyl]di-2,1-phenylene]bis(dimethyl- (9CI) (CA INDEX NAME)

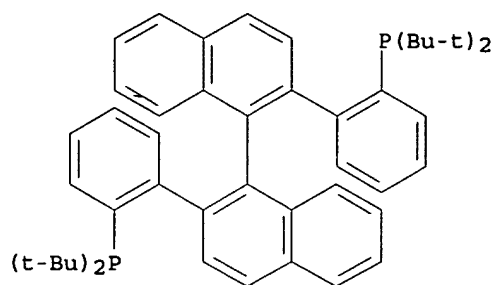


RN 328387-38-8 HCAPLUS  
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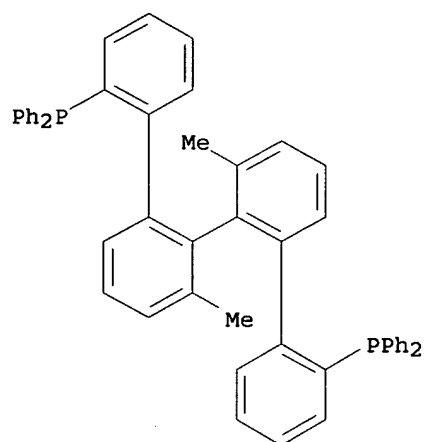


RN 328387-41-3 HCAPLUS  
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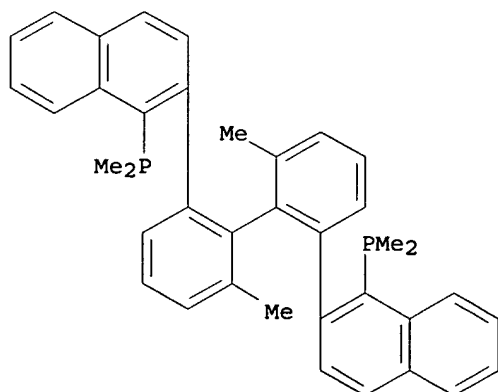




RN 328387-43-5 HCAPLUS  
 CN Phosphine, [(1''R)-3',6''-dimethyl[1,1':2',1'':2'',1'''-  
 quaterphenyl]-2,2'''-diyl]bis[diphenyl- (9CI) (CA INDEX NAME)



RN 328387-44-6 HCAPLUS  
 CN Phosphine, 2,2'-[[[(1R)-6,6'-dimethyl[1,1'-biphenyl]-2,2'-diyl]di-2,1-  
 naphthalenediyl]bis[dimethyl- (9CI) (CA INDEX NAME)



IC ICM C07C039-205  
 ICS C07C233-66; C07D213-04; C07F009-50; C07F009-58  
 CC 29-7 (Organometallic and Organometalloidal  
 Compounds)  
 Section cross-reference(s): 25, 67, 78  
 ST chiral diphosphine ligand transition

metal complex prepn asym catalysis; asym  
hydrogenation chiral diphosphine transition  
metal complex catalyst; phospholane ferrocene binaphane  
transition metal complex prepn catalyst;  
imine redn diphosphine transition metal  
complex; enamide asym hydrogenation diphosphine  
transition metal complex; iridium rhodium  
diphosphine transition metal  
prepn asym reaction catalyst

IT Arylation catalysts  
(Heck; prepn. of chiral diphosphine  
ligands and their transition-metal  
complexes as catalysts for asym. reactions)

IT Alkylation catalysts  
(allylic; prepn. of chiral diphosphine  
ligands and their transition-metal  
complexes as catalysts for asym. reactions)

IT Hydride transfer  
(catalysts; prepn. of chiral diphosphine  
ligands and their transition-metal  
complexes as catalysts for asym. reactions)

IT Ligands  
RL: CAT (Catalyst use); RCT (Reactant); SPN (Synthetic  
preparation); PREP (Preparation); RACT (Reactant or reagent); USES  
(Uses)  
(chiral, diphosphines; prepn. of chiral  
diphosphine ligands and their  
transition-metal complexes as catalysts for  
asym. reactions)

IT Hydrogen transfer catalysts  
(hydride transfer catalysts; prepn. of chiral  
diphosphine ligands and their  
transition-metal complexes as catalysts for  
asym. reactions)

IT Aldol condensation catalysts  
Catalysts  
Cyclopropanation catalysts  
Diels-Alder reaction catalysts  
Epoxidation catalysts  
Hydroboration catalysts  
Hydroformylation catalysts  
Hydrosilylation catalysts  
Isomerization catalysts  
Michael reaction catalysts  
(prepn. of chiral diphosphine ligands  
and their transition-metal complexes as  
catalysts for asym. reactions)

IT Transition metal complexes  
RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP  
(Preparation); USES (Uses)  
(prepn. of chiral diphosphine ligands  
and their transition-metal complexes as  
catalysts for asym. reactions)

IT Imines  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(prepn. of chiral diphosphine ligands  
and their transition-metal complexes as  
catalysts for asym. reactions)

IT Hydrogenation catalysts  
(stereoselective; prepn. of chiral diphosphine  
ligands and their transition-metal  
complexes as catalysts for asym. reactions)

IT Amides, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(unsatd.; prepn. of chiral diphosphine  
ligands and their transition-metal

complexes as catalysts for asym. reactions)

IT 64-19-7, Acetic acid, uses 85-41-6, Phthalimide 100-46-9, Benzylamine, uses 311-28-4, Tetrabutylammonium iodide  
 RL: CAT (Catalyst use); USES (Uses)  
 (additive; binaphane iridium complex catalyzed enantioselective hydrogenation of imine in presence of)

IT 546-68-9, Titanium tetraisopropoxide 1295-35-8, Bis(1,5-Cyclooctadiene)nickel 3153-26-2, Vanadyl bis(acetylacetonate) 3375-31-3, Palladium diacetate 7439-96-5D, Manganese, anionic ligand derivs., uses 7440-02-0D, Nickel, anionic ligand derivs., uses 7440-18-8D, Ruthenium, complexes, uses 7440-50-8D, Copper, aryl and anionic ligand derivs., uses 10025-65-7, Platinum dichloride 12012-95-2, Bis(allyl(chloro)palladium) 12082-47-2, (Acetylacetonato)bis(ethylene)rhodium 12092-47-6, Bis(chloro(1,5-cyclooctadiene)rhodium) 12112-67-3, Bis(chloro(1,5-cyclooctadiene)iridium) 12289-94-0, (1,5-Cyclooctadiene)bis(2-methylallyl)ruthenium 14024-58-9, Bis(acetylacetonato)manganese 14874-82-9, (Acetylacetonato)dicarbonylrhodium 15244-77-6, Dicarbonyldichlororhodium 17524-05-9, Bis(acetoacetonato)dioxomolybdenum 34946-82-2, Cupric triflate 35015-47-5D, Bis(1,5-cyclooctadiene)rhodium(1+), salts 35464-26-7D, Bis(1,5-cyclooctadiene)iridium(1+), salts 42152-44-3, Cuprous triflate 51364-51-3, Tris(dibenzylideneacetone)dipalladium 56819-03-5, Dichloro(1,5-cyclooctadiene)rhodium 62793-31-1, Bis(1,5-cyclooctadiene)rhodium(1+) hexafluorophosphate 70197-13-6, Methylrhenium trioxide  
 RL: CAT (Catalyst use); USES (Uses)  
 (prepn. of chiral diphosphine ligands and their transition-metal complexes as catalysts for asym. reactions)

IT 253311-88-5P, (R,R)-Binaphane 288569-98-2P 328310-06-1P  
 328310-08-3P 328310-10-7P 328310-12-9P 328310-14-1P  
 328310-16-3P 328310-18-5P 328310-20-9P 328310-22-1P  
 328386-97-6DP, esters 328386-98-7P 328386-99-8P 328387-00-4P  
 328387-01-5P 328387-02-6P 328387-03-7P 328387-04-8P  
 328387-05-9P 328387-06-0P 328387-07-1P  
 328387-08-2P 328387-09-3P 328387-10-6P  
 328387-11-7P 328387-12-8P 328387-13-9P  
 328387-14-0P 328387-15-1P 328387-16-2P 328387-17-3P  
 328387-18-4P 328387-19-5P 328387-20-8P 328387-21-9P  
 328387-22-0P 328387-24-2P 328387-25-3P 328387-27-5P  
 328387-28-6P 328387-30-0P 328387-32-2P 328387-34-4P  
 328387-36-6P 328387-38-8P 328387-41-3P  
 328387-43-5P 328387-44-6P 328387-46-8P  
 328387-47-9P 328387-49-1P 328387-51-5P 328387-53-7P  
 328387-55-9DP, esters 328395-00-2P  
 RL: CAT (Catalyst use); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)  
 (prepn. of chiral diphosphine ligands and their transition-metal complexes as catalysts for asym. reactions)

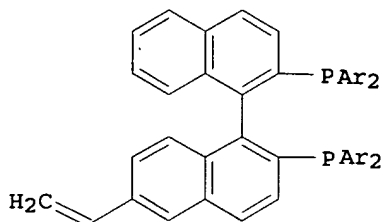
REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L26 ANSWER 37 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2000:705090 HCAPLUS  
 DOCUMENT NUMBER: 133:266977  
 TITLE: Phosphine derivative and polymer thereof and transition metal complex comprising the same  
 INVENTOR(S): Tamao, Kyoko; Sayo, Noboru  
 PATENT ASSIGNEE(S): Takasago International Corp., Japan  
 SOURCE: Eur. Pat. Appl., 23 pp.

DOCUMENT TYPE: CODEN: EPXXDW  
 LANGUAGE: Patent  
 FAMILY ACC. NUM. COUNT: 1 English  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1041077	A2	20001004	EP 2000-400848	200003 28
EP 1041077	A3	20020612		
EP 1041077	B1	20031105		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
JP 2000281691	A2	20001010	JP 1999-88601	199903 30
US 6465594	B1	20021015	US 2000-539413	200003 30
PRIORITY APPLN. INFO.:			JP 1999-88601	A 199903 30

OTHER SOURCE(S): CASREACT 133:266977; MARPAT 133:266977  
 GI



I

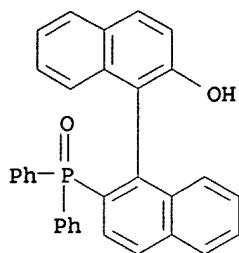
AB Disclosed are a **phosphine** deriv. I (Ar = (un)substituted Ph, (un)substituted naphthyl), a **transition metal** complex comprising the **phosphine** deriv. or a polymer thereof as a **ligand**, and a process for producing an optically active amino acid compd. by asym. hydrogenation using the **transition metal** complex as a catalyst. Thus, I (Ar = Ph) was **prepd.** in several steps starting from (R)-binaphthol, was copolymd. with styrene and divinylbenzene in a polyvinyl alc., chloroform, or a toluene soln. The polymer obtained above was reacted with di(1,5-cyclooctadiene)rhodium tetrafluoroborate to give a catalyst for asym. hydrogenation of Me (Z)- $\alpha$ -benzamidocinnamate.

IT 132548-91-5P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
 (prepn. and bromination of)

RN 132548-91-5 HCAPLUS

CN [1,1'-Binaphthalen]-2-ol, 2'-(diphenylphosphinyl)-, (1R)- (9CI) (CA

INDEX NAME)

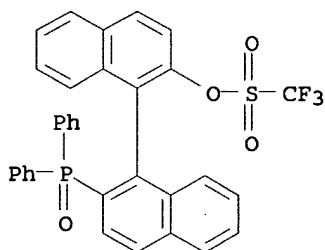


IT 132532-04-8P

RL: RCT (Reactant); SPN (Synthetic preparation); **PREP**  
**(Preparation)**; RACT (Reactant or reagent)  
 (prepn. and hydrolysis of)

RN 132532-04-8 HCAPLUS

CN Methanesulfonic acid, trifluoro-, (1R)-2'-((diphenylphosphino)[1,1'-binaphthalen]-2-yl ester (9CI) (CA INDEX NAME)

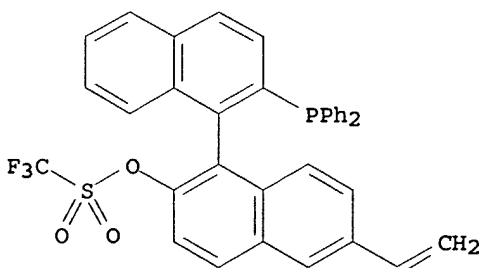


IT 298705-86-9P

RL: RCT (Reactant); SPN (Synthetic preparation); **PREP**  
**(Preparation)**; RACT (Reactant or reagent)  
 (prepn. and nickel-catalyzed phosphination of)

RN 298705-86-9 HCAPLUS

CN Methanesulfonic acid, trifluoro-, 2'-((diphenylphosphino)-6-ethenyl[1,1'-binaphthalen]-2-yl ester, (1R)- (9CI) (CA INDEX NAME)



IT 298695-55-3P

RL: RCT (Reactant); SPN (Synthetic preparation); **PREP**  
**(Preparation)**; RACT (Reactant or reagent)  
 (prepn. and polymn. of)

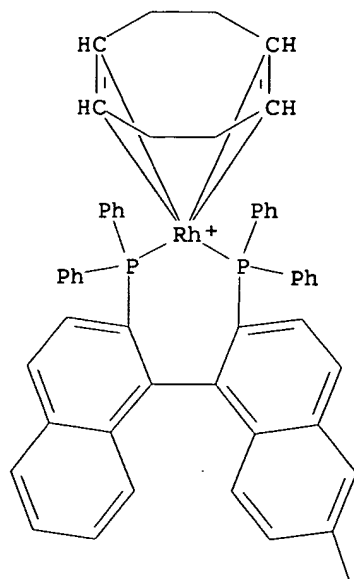
RN 298695-55-3 HCAPLUS

CN Rhodium(1+), [[(1,2,5,6-η)-1,5-cyclooctadiene][[(1R)-6-ethenyl[1,1'-binaphthalene]-2,2'-diyl]bis[diphenylphosphine-κP]]-], tetrafluoroborate(1-) (9CI) (CA INDEX NAME)

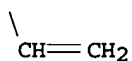
CM 1

CRN 298695-54-2  
 CMF C54 H46 P2 Rh  
 CCI CCS

PAGE 1-A

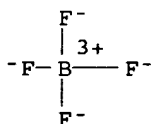


PAGE 2-A



CM 2

CRN 14874-70-5  
 CMF B F4  
 CCI CCS

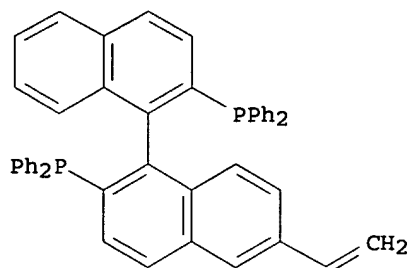


IT 298705-88-1P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP  
 (Preparation); RACT (Reactant or reagent)  
 (prepn. and polymn. with styrene and divinylbenzene)

RN 298705-88-1 HCAPLUS

CN Phosphine, [(1R)-6-ethenyl[1,1'-binaphthalene]-2,2'-  
 diyl]bis[diphenyl- (9CI) (CA INDEX NAME)]



IT 298705-90-5P

RL: RCT (Reactant); SPN (Synthetic preparation); **PREP**  
 (**Preparation**); RACT (Reactant or reagent)  
 (prepn. and reaction with rhodium cyclooctadiene complex)

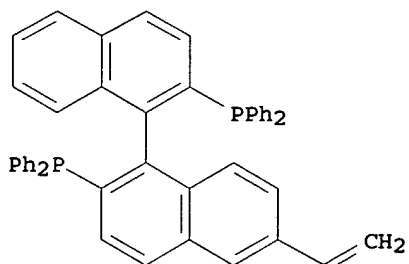
RN 298705-90-5 HCAPLUS

CN Phosphine, [(1R)-6-ethenyl[1,1'-binaphthalene]-2,2'-  
 diyl]bis[diphenyl-, polymer with ethenylbenzene (9CI) (CA INDEX  
 NAME)

CM 1

CRN 298705-88-1

CMF C46 H34 P2



CM 2

CRN 100-42-5

CMF C8 H8

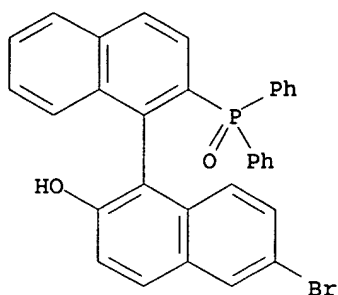
H<sub>2</sub>C=CH-Ph

IT 213314-16-0P 298705-87-0P

RL: RCT (Reactant); SPN (Synthetic preparation); **PREP**  
 (**Preparation**); RACT (Reactant or reagent)  
 (prepn. and redn. with trichlorosilane)

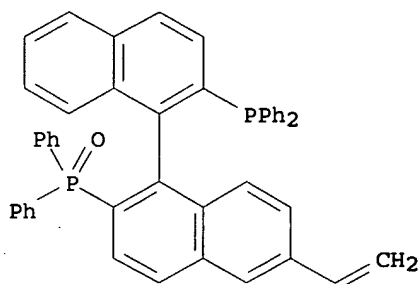
RN 213314-16-0 HCAPLUS

CN [1,1'-Binaphthalen]-2-ol, 6-bromo-2'-(diphenylphosphinyl)-, (1R)-  
 (9CI) (CA INDEX NAME)



RN 298705-87-0 HCAPLUS

CN Phosphine oxide, [(1R)-2'-(diphenylphosphino)-6-ethenyl[1,1'-binaphthalen]-2-yl]diphenyl- (9CI) (CA INDEX NAME)

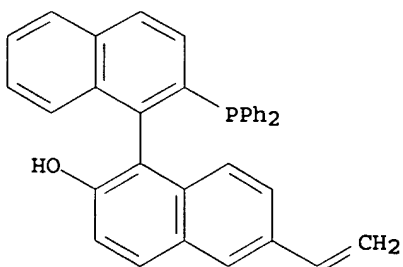


IT 213314-18-2P

RL: RCT (Reactant); SPN (Synthetic preparation); **PREP**  
(**Preparation**); RACT (Reactant or reagent)  
(prepn. and triflation of)

RN 213314-18-2 HCAPLUS

CN [1,1'-Binaphthalen]-2-ol, 2'-(diphenylphosphino)-6-ethenyl-, (1R)- (9CI) (CA INDEX NAME)



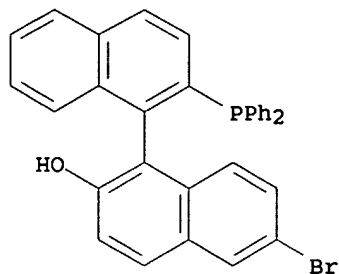
IT 213314-17-1P

RL: RCT (Reactant); SPN (Synthetic preparation); **PREP**  
(**Preparation**); RACT (Reactant or reagent)  
(prepn. and vinylation with vinylidioxaborinane)

RN 213314-17-1 HCAPLUS

CN [1,1'-Binaphthalen]-2-ol, 6-bromo-2'-(diphenylphosphino)-, (1R)- (9CI) (CA INDEX NAME)





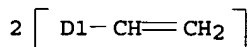
IT 298695-56-4P 298695-57-5P 298705-90-5DP,  
 reaction products with bis(cyclooctadiene)rhodium tetrafluoroborate  
 RL: CAT (Catalyst use); SPN (Synthetic preparation);  
 PREP (Preparation); USES (Uses)  
 (prepn. as asym. hydrogenation catalyst for prepn. of optically  
 active amino acid)  
 RN 298695-56-4 HCAPLUS  
 CN Rhodium(1+), [(1,2,5,6-η)-1,5-cyclooctadiene][[(1R)-6-  
 ethenyl[1,1'-binaphthalene]-2,2'-diyl]bis[diphenylphosphine-  
 κP]]-, tetrafluoroborate(1-), polymer with diethenylbenzene  
 and ethenylbenzene (9CI) (CA INDEX NAME)

CM 1

CRN 1321-74-0

CMF C10 H10

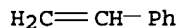
CCI IDS



CM 2

CRN 100-42-5

CMF C8 H8



CM 3

CRN 298695-55-3

CMF C54 H46 P2 Rh . B F4

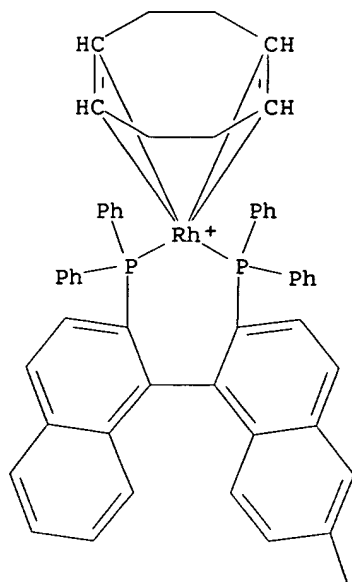
CM 4

CRN 298695-54-2

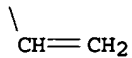
CMF C54 H46 P2 Rh

CCI CCS

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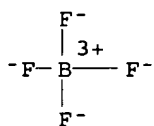


CM 5

CRN 14874-70-5

CMF B F4

CCI CCS

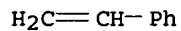


RN 298695-57-5 HCAPLUS  
 CN Rhodium(1+), [(1,2,5,6-η)-1,5-cyclooctadiene][[(1R)-6-ethenyl[1,1'-binaphthalene]-2,2'-diyl]bis[diphenylphosphine-κP]]-, tetrafluoroborate(1-), polymer with ethenylbenzene (9CI) (CA INDEX NAME)

CM 1

CRN 100-42-5

CMF C8 H8



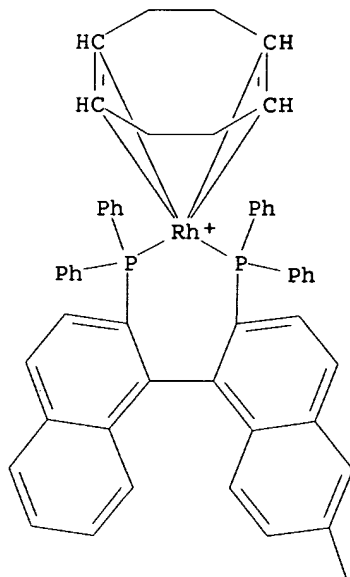
CM 2

CRN 298695-55-3  
 CMF C54 H46 P2 Rh . B F4

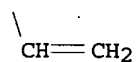
CM 3

CRN 298695-54-2  
 CMF C54 H46 P2 Rh  
 CCI CCS

PAGE 1-A

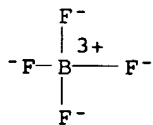


PAGE 2-A



CM 4

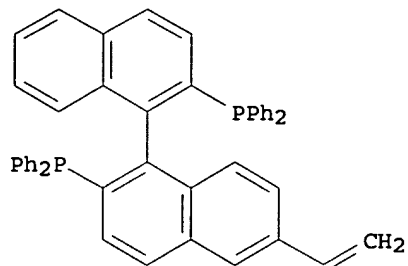
CRN 14874-70-5  
 CMF B F4  
 CCI CCS



RN 298705-90-5 HCAPLUS  
 CN Phosphine, [(1R)-6-ethenyl[1,1'-binaphthalene]-2,2'-diyl]bis[diphenyl-, polymer with ethenylbenzene (9CI) (CA INDEX NAME)]

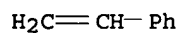
CM 1

CRN 298705-88-1  
CMF C46 H34 P2



CM 2

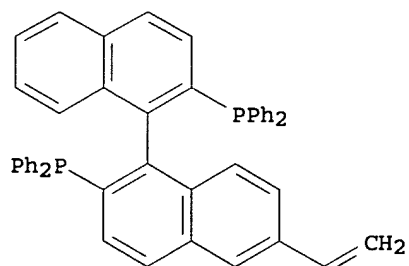
CRN 100-42-5  
CMF C8 H8



IT 298705-89-2P  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. of)  
RN 298705-89-2 HCAPLUS  
CN Phosphine, [(1R)-6-ethenyl[1,1'-binaphthalene]-2,2'-  
diyl]bis[diphenyl-, polymer with diethenylbenzene and ethenylbenzene  
(9CI) (CA INDEX NAME)

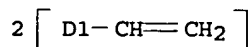
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CRN 298705-88-1  
CMF C46 H34 P2



CM 2

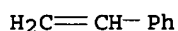
CRN 1321-74-0  
CMF C10 H10  
CCI IDS



CM 3

CRN 100-42-5

CMF C8 H8



IC ICM C07F009-50  
ICS C07F015-00; C08F030-02; C08F030-04; C07B053-00  
ICI C07M007-00  
CC 29-13 (Organometallic and Organometalloidal Compounds)  
Section cross-reference(s): 25, 67  
IT 6737-42-4, 1,3-Bis(diphenylphosphino)propane  
RL: CAT (Catalyst use); USES (Uses)  
(palladium catalyzed phosphination of triflated binaphthol in presence of)  
IT 14647-23-5, Dichloro[1,2-bis(diphenylphosphino)ethane]nickel  
RL: CAT (Catalyst use); USES (Uses)  
(phosphination of triflated vinylphosphinobinaphthalene catalyzed with)  
IT 132548-91-5P  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(prepn. and bromination of)  
IT 132532-04-8P  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(prepn. and hydrolysis of)  
IT 298705-86-9P  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(prepn. and nickel-catalyzed phosphination of)  
IT 298695-55-3P  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(prepn. and polymn. of)  
IT 298705-88-1P  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(prepn. and polymn. with styrene and divinylbenzene)  
IT 298705-90-5P  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(prepn. and reaction with rhodium cyclooctadiene complex)  
IT 213314-16-0P 298705-87-0P  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(prepn. and redn. with trichlorosilane)  
IT 213314-18-2P  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(prepn. and triflation of)

IT 213314-17-1P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
 (prepn. and vinylation with vinyl dioxaborinane)

IT 35138-22-8DP, Bis(cyclooctadiene)rhodium tetrafluoroborate, reaction products with (R)-6-vinyl-2,2'-bis(diphenylphosphino)-1,1'-binaphthalene-styrene copolymer 298695-56-4P  
 298695-57-5P 298705-90-5DP, reaction products with bis(cyclooctadiene)rhodium tetrafluoroborate  
 RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
 (prepn. as asym. hydrogenation catalyst for prepn. of optically active amino acid)

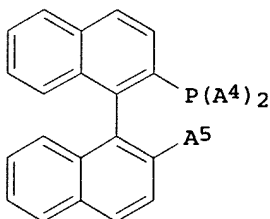
IT 298705-89-2P  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (prepn. of)

L26 ANSWER 38 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2000:658089 HCAPLUS  
 DOCUMENT NUMBER: 133:237683  
 TITLE: Preparation of optically active aromatic sulfonylamines  
 INVENTOR(S): Hayashi, Tamio  
 PATENT ASSIGNEE(S): Sumitomo Chemical Co., Ltd., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 9 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2000256305	A2	20000919	JP 1999-63214	199903.10

PRIORITY APPLN. INFO.: JP 1999-63214  
 199903.10

OTHER SOURCE(S): CASREACT 133:237683; MARPAT 133:237683  
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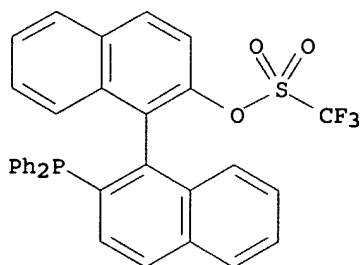


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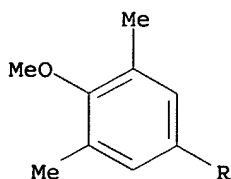
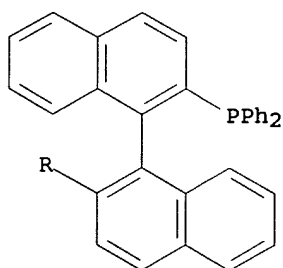
AB A1CA3NHSO2A2 [A1-A3 = (un)substituted alkyl, aralkyl, aryl] are prepd. by reaction of A1CH:NSO2A2 (A1-A2 = same as above) with A3SnR1R2R3 (A3 = same as above; R1-R3 = H, alkyl, alkoxy) in the presence of transition metal complex having optically active phosphines I [A4 = (un)substituted alkyl, aralkyl, aryl; A5 = (un)substituted alkyl, aralkyl, aryl, alkoxy] as ligands. 4-Nitro-N-(4-trifluoromethylbenzylidene)benzenesulfonamide was reacted with PhSnMe3 in the presence of

2,4-pentanedionatobis(ethylene)rhodium(I) and (R)-2-(diphenylphosphino)-2'-(3,5-dimethyl-4-methoxy)-1,1'-binaphthyl at 110° for 12 h to give 70% [(4-nitrophenylsulfonyl)[phenyl[4-(trifluoromethyl)phenyl]methyl]amine with 96% e.e.

- IT 187742-81-0P, (R)-2-(Diphenylphosphino)-2'-[(trifluoromethanesulfonyl)oxy]-1,1'-binaphthyl  
 RL: PNU (Preparation, unclassified); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)  
 (in prepn. of catalyst ligand; prepn. of optically active arom. sulfonylamines by addn. of benzylideneamines with org. tin)  
 RN 187742-81-0 HCAPLUS  
 CN Methanesulfonic acid, trifluoro-, (1R)-2'-(diphenylphosphino)[1,1'-binaphthalen]-2-yl (9CI) (CA INDEX NAME)

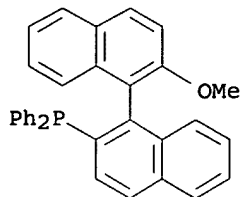


- IT 261773-75-5P, (R)-2-(Diphenylphosphino)-2'-(3,5-dimethyl-4-methoxyphenyl)-1,1'-binaphthyl  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
 (in prepn. of catalyst ligand; prepn. of optically active arom. sulfonylamines by addn. of benzylideneamines with org. tin)  
 RN 261773-75-5 HCAPLUS  
 CN Phosphine, [(1R)-2'-(4-methoxy-3,5-dimethylphenyl)[1,1'-binaphthalen]-2-yl]diphenyl- (9CI) (CA INDEX NAME)



- IT 134484-36-9DP, (S)-2-(Diphenylphosphino)-2'-methoxy-1,1'-binaphthyl, rhodium complex  
 RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
 (prepn. of optically active arom. sulfonylamines by addn. of benzylideneamines with org. tin)

RN 134484-36-9 HCAPLUS  
 CN Phosphine, [(1S)-2'-methoxy[1,1'-binaphthalen]-2-yl]diphenyl- (9CI)  
 (CA INDEX NAME)



IC ICM C07C303-36  
 ICS B01J031-24; C07B053-00; C07C311-21; C07F009-50; C07B061-00;  
 C07M007-00  
 CC 25-12 (Benzene, Its Derivatives, and Condensed Benzenoid Compounds)  
 IT 187742-81-0P, (R)-2-(Diphenylphosphino)-2'-  
 [(trifluoromethanesulfonyl)oxy]-1,1'-binaphthyl  
 RL: PNU (Preparation, unclassified); RCT (Reactant); **PREP**  
 (Preparation); RACT (Reactant or reagent)  
 (in prepn. of catalyst ligand; prepn. of optically active arom.  
 sulfonylamines by addn. of benzylideneamines with org. tin)  
 IT 261773-75-5P, (R)-2-(Diphenylphosphino)-2'-(3,5-dimethyl-4-  
 methoxyphenyl)-1,1'-binaphthyl  
 RL: RCT (Reactant); SPN (Synthetic preparation); **PREP**  
 (Preparation); RACT (Reactant or reagent)  
 (in prepn. of catalyst ligand; prepn. of optically active arom.  
 sulfonylamines by addn. of benzylideneamines with org. tin)  
 IT 134484-36-9DP, (S)-2-(Diphenylphosphino)-2'-methoxy-1,1'-  
 binaphthyl, rhodium complex  
 RL: CAT (Catalyst use); SPN (Synthetic preparation);  
**PREP** (Preparation); USES (Uses)  
 (prepn. of optically active arom. sulfonylamines by addn. of  
 benzylideneamines with org. tin)

L26 ANSWER 39 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2000:592728 HCAPLUS

DOCUMENT NUMBER: 133:177311

TITLE: Preparation of chiral biphenyl- and  
 binaphthyl-based diphosphines and use in  
 asymmetric catalysis

INVENTOR(S): Lemaire, Marc; Ter Halle, Rob; Schulz,  
 Emmanuelle; Spagnol, Michel

PATENT ASSIGNEE(S): Rhodia Chimie, Fr.; Centre National De La  
 Recherche Scientifique (C.N.R.S.)

SOURCE: PCT Int. Appl., 58 pp.  
 CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: French

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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WO 2000049028	A1	20000824	WO 2000-FR83	200001 14

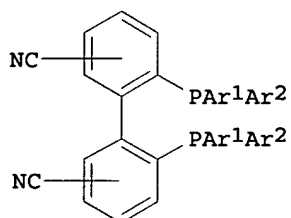
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 CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU,  
 ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT,  
 LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU,

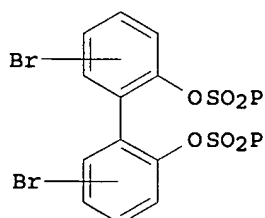


SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN,  
 YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM  
 RW: GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY,  
 DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF,  
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 FR 2789992 A1 20000825 FR 1999-2119 199902  
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 R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC,  
 PT, IE, SI, LT, LV, FI, RO  
 JP 2002537305 T2 20021105 JP 2000-599766 200001  
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 PRIORITY APPLN. INFO.: FR 1999-2119 A 199902  
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 WO 2000-FR83 W 200001  
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 US 2001-913831 A3 200112  
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OTHER SOURCE(S): CASREACT 133:177311; MARPAT 133:177311  
 GI



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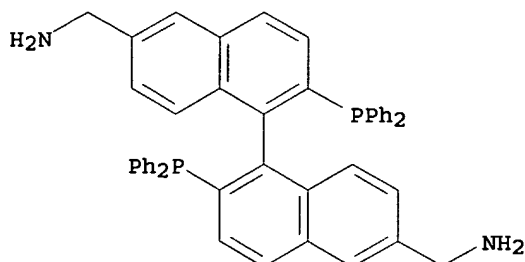


II

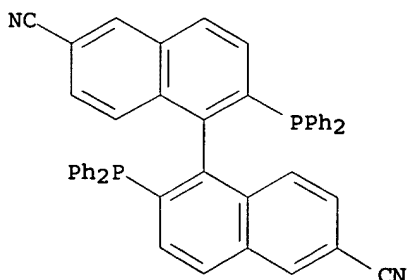
AB The invention concerns a method for prepg. I (optionally further substituted biphenyl may also be binaphthyl; Ar1, Ar2 independently represent a satd. or arom. carbocyclic group, optionally substituted). The prepn. method comprises several steps: (i) bromination of an enantiomer of 2,2'-bisphenol or 2,2'-binaphthol, (ii) esterification using a sulfonic acid or an activated form (e.g. triflic anhydride), (iii) substitution of Br by cyano, (iv) coupling with XPAR1Ar2 (X = H, halogen). The dicyano derivs. can be reduced to aminomethyl derivs. and both can be incorporated into transition metal complexes for asym. catalysis. For example, an hydrogenation

catalyst prep'd. from bis(2-methylallyl)(cyclooctadiene)ruthenium and (S)-6,6'-bis(aminomethyl)-2,2'-bis(diphenylphosphino)-1,1'-binaphthyl gave 100% Me 3-hydroxybutanoate from Me acetoacetate with an 100% ee. This catalyst system also is effective in the hydrogenation of acetophenone (72% yield with 18% ee compared to <1% yield and 0% ee for the analogous complex contg. a 2,2'-bis(diphenylphosphino)-1,1'-binaphthyl enantiomer). The dicyano derivs. can also be converted to dicarboxy derivs. II (optionally further substituted biphenyl may also be binaphthyl; P = aliph. hydrocarbyl, carbocyclic aryl, aliph. group substituted by carbocyclic aryl; P neither CF<sub>3</sub> nor p-tolyl) are also claimed.

- IT 263163-80-0P, (S)-6,6'-Bis(aminomethyl)-2,2'-bis(diphenylphosphino)-1,1'-binaphthyl  
 RL: CAT (Catalyst use); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)  
 (prepn. and ligand in transition metal complex asym. catalysts)
- RN 263163-80-0 HCAPLUS
- CN [1,1'-Binaphthalene]-6,6'-dimethanamine, 2,2'-bis(diphenylphosphino)-, (1S)- (9CI) (CA INDEX NAME)



- IT 263163-79-7P, (S)-6,6'-Dicyano-2,2'-bis(diphenylphosphino)-1,1'-binaphthyl  
 RL: CAT (Catalyst use); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)  
 (prepn., cyano redn. and ligand in transition metal complex asym. catalysts)
- RN 263163-79-7 HCAPLUS
- CN [1,1'-Binaphthalene]-6,6'-dicarbonitrile, 2,2'-bis(diphenylphosphino)-, (1S)- (9CI) (CA INDEX NAME)



- IC ICM C07F009-50  
 ICS B01J031-24; C07B053-00; C07C309-63
- CC 29-7 (Organometallic and Organometalloidal Compounds)  
 Section cross-reference(s): 21, 67
- IT **Phosphines**  
 RL: CAT (Catalyst use); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent); USES

(Uses)

(diphosphines; prepn. of chiral biphenyl- and binaphthyl-based diphosphines and use as ligands in transition metal complexes in asym. catalysis)

- IT Platinum-group metal complexes  
RL: CAT (Catalyst use); FMU (Formation, unclassified);  
FORM (Formation, nonpreparative); USES (Uses)  
(prepn. of chiral biphenyl- and binaphthyl-based diphosphines and use as ligands in transition metal complexes in asym. catalysis)
- IT Ketones, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(prepn. of chiral biphenyl- and binaphthyl-based diphosphines and use as ligands in transition metal complexes in asym. hydrogenation of)
- IT Catalysts  
Hydrogenation catalysts  
(stereoselective; prepn. of chiral biphenyl- and binaphthyl-based diphosphines and use as ligands in transition metal complexes as)
- IT 7439-88-5D, Iridium, complexes with chiral diphosphinobiphenyl and -binaphthyl derivs., uses 7440-16-6D, Rhodium, complexes with chiral diphosphinobiphenyl and -binaphthyl derivs., uses  
RL: CAT (Catalyst use); FMU (Formation, unclassified);  
FORM (Formation, nonpreparative); USES (Uses)  
(formation and asym. catalysis by)
- IT 263163-80-0P, (S)-6,6'-Bis(aminomethyl)-2,2'-bis(diphenylphosphino)-1,1'-binaphthyl  
RL: CAT (Catalyst use); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)  
(prepn. and ligand in transition metal complex asym. catalysts)
- IT 98-85-1P, 1-Phenylethanol 53562-86-0P, (S)-Methyl 3-hydroxybutanoate  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. of chiral biphenyl- and binaphthyl-based diphosphines and use as ligands in transition metal complexes in asym. hydrogenation giving)
- IT 98-86-2, Acetophenone, reactions 105-45-3, Methyl acetoacetate  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(prepn. of chiral biphenyl- and binaphthyl-based diphosphines and use as ligands in transition metal complexes in asym. hydrogenation of)
- IT 263163-79-7P, (S)-6,6'-Dicyano-2,2'-bis(diphenylphosphino)-1,1'-binaphthyl  
RL: CAT (Catalyst use); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)  
(prepn., cyano redn. and ligand in transition metal complex asym. catalysts)
- IT 12289-94-0, (1,5-Cyclooctadiene)bis(2-methylallyl)ruthenium  
RL: CAT (Catalyst use); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)  
(reactions with chiral diphosphinobinaphthyl derivs. for prepn. of asym. catalysts)

REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L26 ANSWER 40 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2000:446878 HCAPLUS

DOCUMENT NUMBER: 133:237383  
 TITLE: Synthesis and evaluation of a new steroidal BINAP type phosphine  
 AUTHOR(S): Enev, V.; Harre, M.; Nickisch, K.; Schneider, M.; Mohr, J. T.  
 CORPORATE SOURCE: Process Research, Schering AG-Berlin, Berlin, D-13342, Germany  
 SOURCE: Tetrahedron: Asymmetry (2000), 11(8), 1767-1779  
 CODEN: TASYE3; ISSN: 0957-4166  
 PUBLISHER: Elsevier Science Ltd.  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English

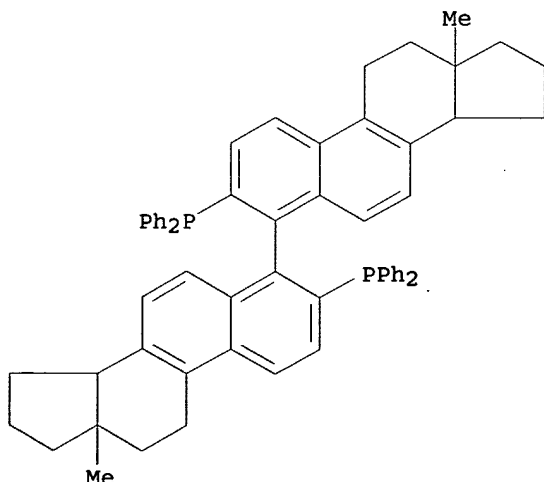
AB A short and high-yielding synthesis of a new cis-configured bissteroidal phosphine was reported. The target ligands were (-)-(4S,14 $\alpha$ )-(14' $\beta$ )-[4,4'-biestra-1,3,5,7,9-pentaene]-3,3'-diylbis[diphenylphosphine] and (+)-(4R,14 $\alpha$ )-(14' $\beta$ )-[4,4'-biestra-1,3,5,7,9-pentaene]-3,3'-diylbis[diphenylphosphine]. These new ligands were compared to previously reported trans-configured ligands (4R,14 $\beta$ )-(14' $\beta$ )-[4,4'-biestra-1,3,5,7,9-pentaene]-3,3'-diylbis[diphenylphosphine] and (4S,14 $\beta$ )-(14' $\beta$ )-[4,4'-biestra-1,3,5,7,9-pentaene]-3,3'-diylbis[diphenylphosphine]. A comparison of these new phosphines as ligands for ruthenium-based hydrogenation catalysts with the previously synthesized diastereomeric trans-configured phosphines showed that the steroid backbone exerts only a minor influence on the enantioselection of the ruthenium catalysts and confirms that the bissteroidal phosphines behave as "pseudo"-enantiomers in spite of their diastereomeric nature. Evidence is presented that the mode of catalyst prepn., i.e. catalyst structure, is the crucial reaction parameter which mainly detes. the enantiomeric excess of the hydrogenation products.

IT 246254-75-1P, (+)-(4R,14 $\alpha$ )-(14' $\beta$ )-[4,4'-Biestra-1,3,5,7,9-pentaene]-3,3'-diylbis[diphenylphosphine]  
 246254-94-4P, (-)-(4S,14 $\alpha$ )-(14' $\beta$ )-[4,4'-Biestra-1,3,5,7,9-pentaene]-3,3'-diylbis[diphenylphosphine]  
 RL: CAT (Catalyst use); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)

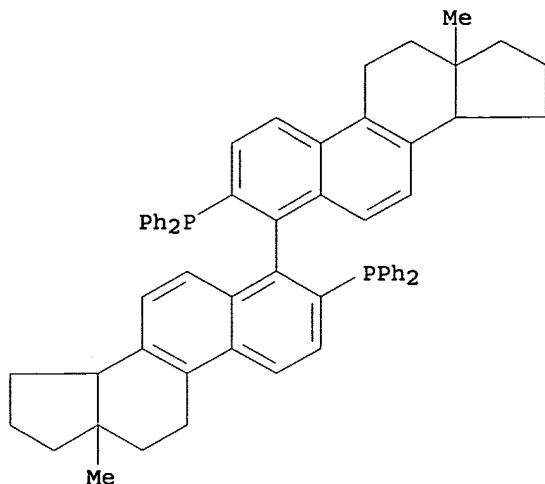
(prepn. and evaluation of steroidal BINAP type phosphine ligands)

RN 246254-75-1 HCAPLUS

CN Phosphine, (4R,14 $\beta$ )-(14' $\beta$ )-[4,4'-biestra-1,3,5,7,9-pentaene]-3,3'-diylbis[diphenyl- (9CI) (CA INDEX NAME)

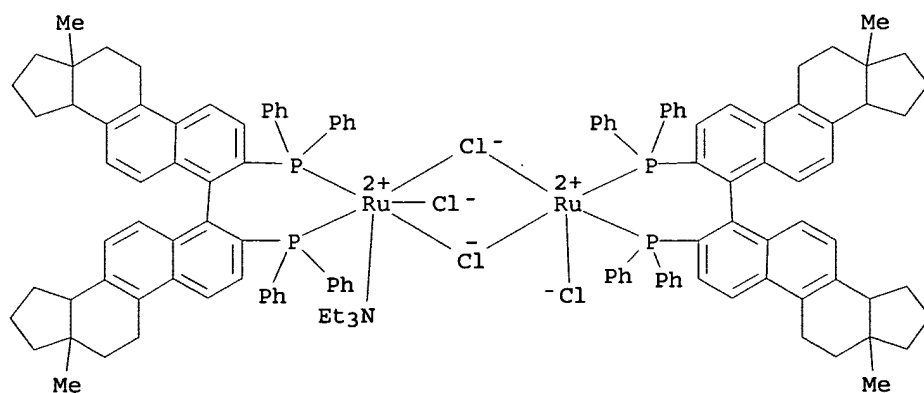


RN 246254-94-4 HCAPLUS  
 CN Phosphine, (4S,14 $\beta$ )-(14' $\beta$ )-[4,4'-biestra-1,3,5,7,9-pentaene]-3,3'-diylbis[diphenyl- (9CI) (CA INDEX NAME)]



IT 292134-48-6P  
 RL: CAT (Catalyst use); SPN (Synthetic preparation);  
 PREP (Preparation); USES (Uses)  
 (prepn. and evaluation of steroidal BINAP type  
 phosphine ligands)

RN 292134-48-6 HCAPLUS  
 CN Ruthenium, bis[[4,4'-biestra-1,3,5,7,9-pentaene]-3,3'-diylbis[diphenylphosphine- $\kappa$ P]]di- $\mu$ -chlorodichloro(N,N-diethylethanamine)di- (9CI) (CA INDEX NAME)



CC 21-2 (General Organic Chemistry)  
 IT 246254-75-1P, (+)-(4R,14 $\alpha$ )-(14' $\beta$ )-[4,4'-Biestra-1,3,5,7,9-pentaene]-3,3'-diylbis[diphenylphosphine]  
 246254-94-4P, (-)-(4S,14 $\alpha$ )-(14' $\beta$ )-[4,4'-Biestra-1,3,5,7,9-pentaene]-3,3'-diylbis[diphenylphosphine]  
 RL: CAT (Catalyst use); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)  
 (prepn. and evaluation of steroidal BINAP type  
 phosphine ligands)  
 IT 292134-48-6P

RL: CAT (Catalyst use); SPN (Synthetic preparation);  
 PREP (Preparation); USES (Uses)  
 (prepn. and evaluation of steroidal BINAP type  
 phosphine ligands)

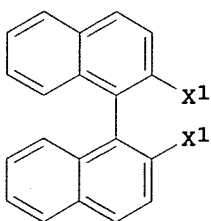
REFERENCE COUNT: 14 THERE ARE 14 CITED REFERENCES AVAILABLE  
 FOR THIS RECORD. ALL CITATIONS AVAILABLE  
 IN THE RE FORMAT

L26 ANSWER 41 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2000:316969 HCAPLUS  
 DOCUMENT NUMBER: 132:334625  
 TITLE: Preparation of phosphinobinaphthyls from  
 binaphthols and phosphines  
 INVENTOR(S): Kawada, Mitsuru; Yamano, Toru; Yamashita,  
 Masayuki  
 PATENT ASSIGNEE(S): Takeda Chemical Industries, Ltd., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 12 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2000136194	A2	20000516	JP 1999-235553	199908 23

PRIORITY APPLN. INFO.: JP 1998-238473 A 199808  
 25

OTHER SOURCE(S): CASREACT 132:334625; MARPAT 132:334625  
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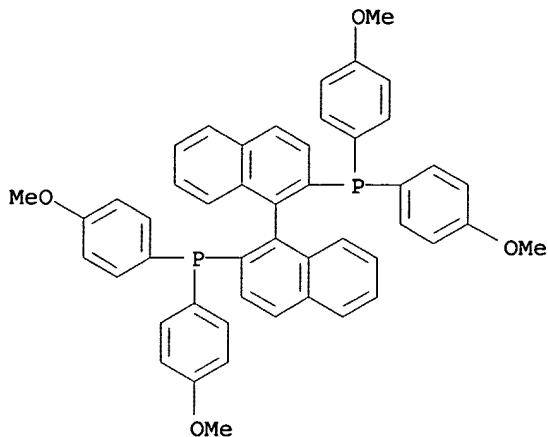
AB Title compds. I (X1, X2 = PAR<sub>2</sub>; Ar = substituted Ph), useful as  
 ligands for transition metal catalysts  
 for asym. synthesis, are prepd. by reaction of I  
 [X1= OR<sub>1</sub>; X2 = OR<sub>2</sub>; R<sub>1</sub>, R<sub>2</sub> = (substituted) alkyl, arylsulfonyl] with  
 substituted diphenylphosphines in the presence of amines  
 and transition metals. (S)-2,2'-  
 bis(trifluoromethanesulfonyloxy)-1,1'-binaphthyl (prepn.  
 given) was condensed with bis(3,5-dimethylphenyl)phosphine  
 (prepn. given) in the presence of [1,2-  
 bis(diphenylphosphino)ethane] (dichloro)nickel and  
 1,4-diazabicyclo[2,2,2]octane in DMF at 100° to give 53.8%  
 (S)-I [X1 = X2 = P(C<sub>6</sub>H<sub>3</sub>Me<sub>2</sub>-3,5)<sub>2</sub>].

IT 121457-43-0P 123362-62-9P 135139-00-3P  
 137219-86-4P  
 RL: IMF (Industrial manufacture); SPN (Synthetic preparation);  
 PREP (Preparation)

(prepn. of phosphinobinaphthyls from binaphthols and phosphines)

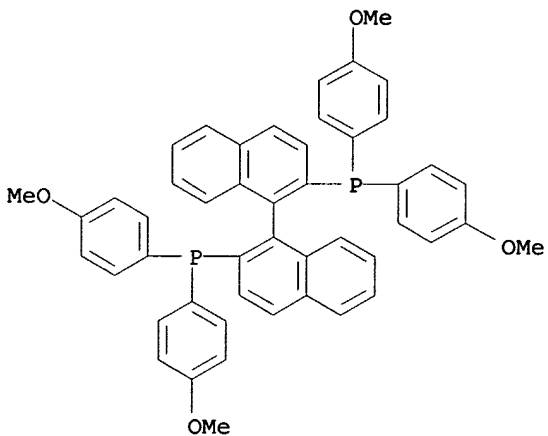
RN 121457-43-0 HCAPLUS

CN Phosphine, (1R)-[1,1'-binaphthalene]-2,2'-diylbis[bis(4-methoxyphenyl)]- (9CI) (CA INDEX NAME)



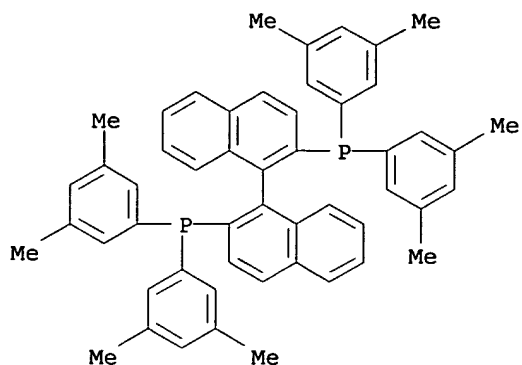
RN 123362-62-9 HCAPLUS

CN Phosphine, (1S)-[1,1'-binaphthalene]-2,2'-diylbis[bis(4-methoxyphenyl)]- (9CI) (CA INDEX NAME)

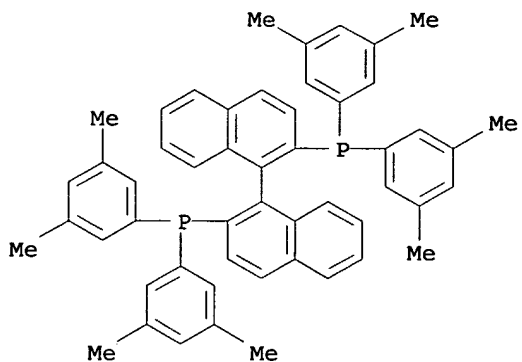


RN 135139-00-3 HCAPLUS

CN Phosphine, [(1S)-[1,1'-binaphthalene]-2,2'-diyl]bis[bis(3,5-dimethylphenyl)]- (9CI) (CA INDEX NAME)



RN 137219-86-4 HCAPLUS  
 CN Phosphine, (1R)-[1,1'-binaphthalene]-2,2'-diylbis[bis(3,5-dimethylphenyl)- (9CI) (CA INDEX NAME)



IC ICM C07F009-50  
 ICS B01J031-24; C07B053-00; C07B061-00; C07M007-00  
 CC 29-7 (Organometallic and Organometalloidal Compounds)  
 IT Amines, uses  
 Transition metals, uses  
 RL: CAT (Catalyst use); USES (Uses)  
 (catalysts; prepn. of phosphinobinaphthyls from binaphthols and phosphines)  
 IT 280-57-9, 1,4-Diazabicyclo[2.2.2]octane 14647-23-5,  
 1,2-Bis(diphenylphosphino)ethane]dichloronickel  
 RL: CAT (Catalyst use); USES (Uses)  
 (catalyst; prepn. of phosphinobinaphthyls from binaphthols and phosphines)  
 IT 121457-43-0P 123362-62-9P 135139-00-3P  
 137219-86-4P  
 RL: IMF (Industrial manufacture); SPN (Synthetic preparation);  
 PREP (Preparation)  
 (prepn. of phosphinobinaphthyls from binaphthols and phosphines)

L26 ANSWER 42 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2000:197485 HCAPLUS

DOCUMENT NUMBER: 132:237203

TITLE: Chemical processes using aryl diphosphine containing catalysts

INVENTOR(S): Kohlpaintner, Christian W.; Hanson, Brian E.;  
 Ding, Hao

PATENT ASSIGNEE(S): Celanese International Corporation, USA;  
 Virginia Poly-Technic Inc.



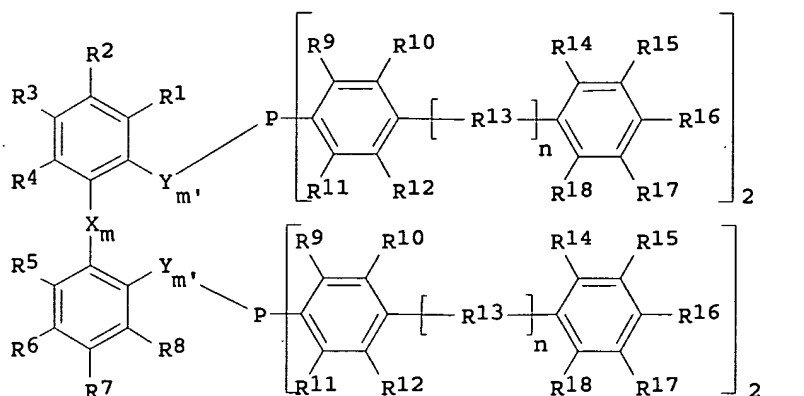
SOURCE: U.S., 14 pp.  
 CODEN: USXXAM  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6043398	A	20000328	US 1996-634533	19960418

PRIORITY APPLN. INFO.: <--  
 US 1996-634533

19960418

OTHER SOURCE(S): <--  
 CASREACT 132:237203; MARPAT 132:237203  
 GI



I

AB Water-sol. **diphosphines I** [X, Y = C1-20 alkyl, alkenyl or alkynyl, Ph, naphthyl, NR, O, S; R = H, C1-20 alkyl, Ph; m, m' = 0, 1; R1-R8 = H, halo, NO2, amino, C1-20 alkyl, alkoxy, OH, CO2R, CN, SO3M (M = alkali or alk. earth metal), N+R3X- (X- = halide), aryl; R1 and R2, R2 and R3, R3 and R4, R5 and R6, R6 and R7, R7 and R8 may also form an (un)substituted ring contg. 2-6 C, O, N and/or S atoms or their mixts.; R9-R12 and R14-R18 = H, halo, SO3M, N+R4, C1-20 alkyl, CO2M, N+R3X-, CN, OR, CO2R, PR2, same R; R13 = (un)branched C1-20 alkyl, alkenyl or alkynyl, (un)substituted Ph, naphthyl or anthryl; n = 0-20; at least one of R1-R12 and R14-R18 = SO3M] complexed with a **transition metal** (selected from Mn, Co, Ni, Cr, Fe, Re, Ru, Rh, Tc, Pd, Pt, Os, Cu, Cd, In, W, Mo, Hg, Au, Ag) having 0-7 **ligands L** (L = CO, NO, PF3, H2O, S, halo, PF6, CN, hydrides, BF4, arenes, olefins, acetylenes, **phosphines**) to form a novel catalyst, useful in hydroformylation of (un)substituted olefins or asym. hydrogenation, etc., are claimed. In an example, two-phase hydroformylation of 1-octene with 210 psi CO/H2 in presence of a rhodium catalyst formed from Rh(acac)(CO)2 and tetrasodium 2,2'-bis[bis(p-(3-p-sulfonatophenyl)propyl)phenyl]phosphinomethyl-1,1'-biphenyl (**prepn.** given) gave a 74% yield of C9 aldehydes having a 93% selectivity for 1-nonanal, in contrast to 58% yield/74% selectivity when TPPTS [P(C6H4SO3Na-m)3] was used.

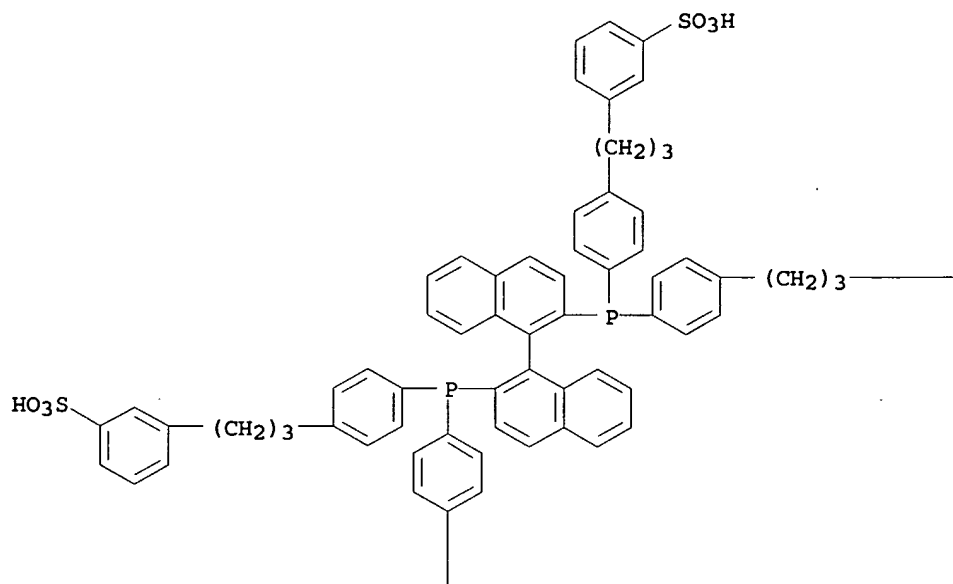
IT 261961-72-2P 261961-75-5P 261969-19-1P

RL: CAT (Catalyst use); SPN (Synthetic preparation);  
PREP (Preparation); USES (Uses)  
(prepn. of aryl diphosphines as  
ligands for transition metal  
catalysts)

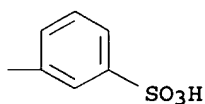
RN 261961-72-2 HCAPLUS

CN Benzenesulfonic acid, 3,3',3'',3'''-[[[1,1'-binaphthalene]-2,2'-  
diylbis[phosphinidynebis(4,1-phenylene-3,1-propanediyl)]]tetrakis-,  
tetrasodium salt (9CI) (CA INDEX NAME)

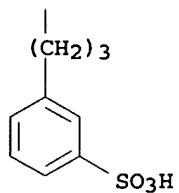
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PAGE 1-B



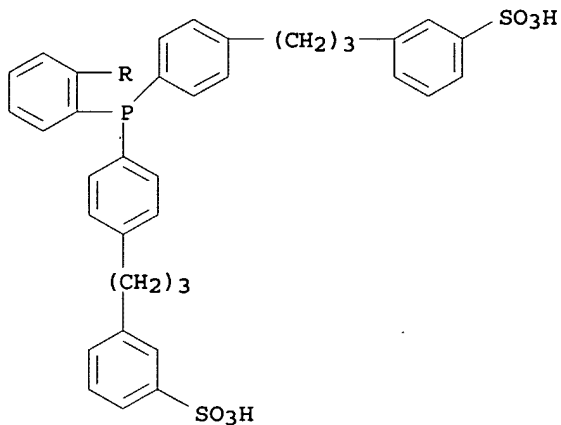
PAGE 2-A



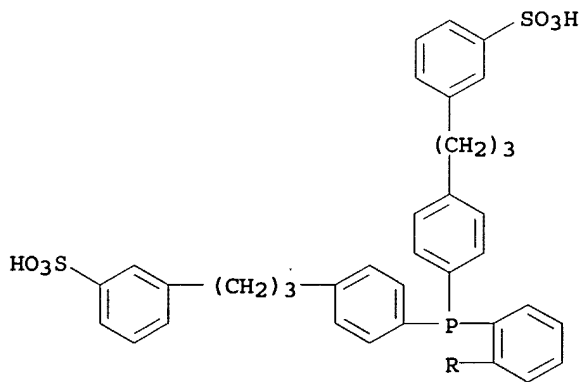
●4 Na

RN 261961-75-5 HCAPLUS  
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PAGE 1-A



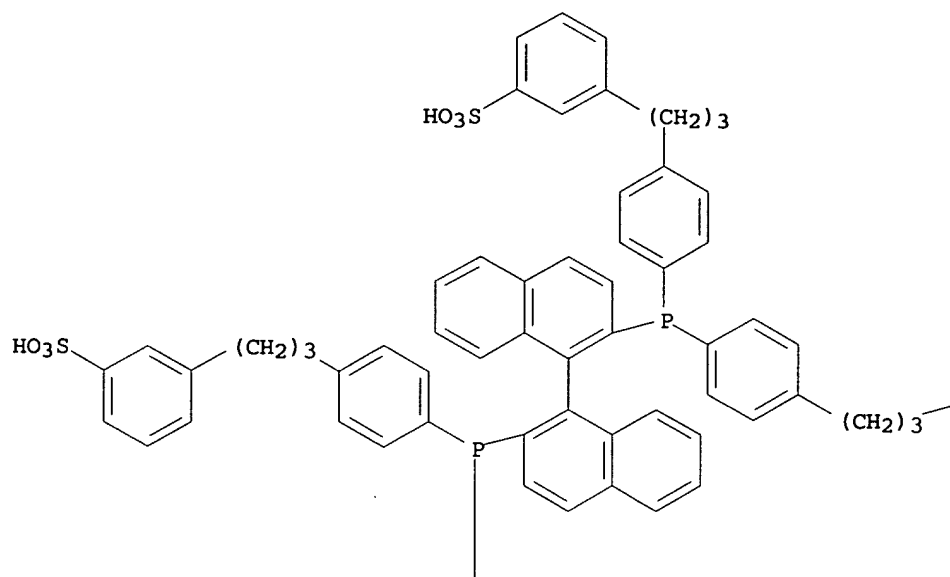
PAGE 2-A



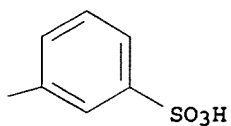
●4 Na

RN 261969-19-1 HCAPLUS  
CN Benzenesulfonic acid, 3,3',3'',3'''-[(1R)-[1,1'-binaphthalene]-2,2'-diylbis[phosphinidynebis(4,1-phenylene-3,1-propanediyl)]]tetrakis-, tetrasodium salt (9CI) (CA INDEX NAME)

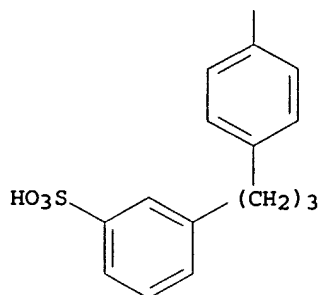
PAGE 1-A



PAGE 1-B



PAGE 2-A



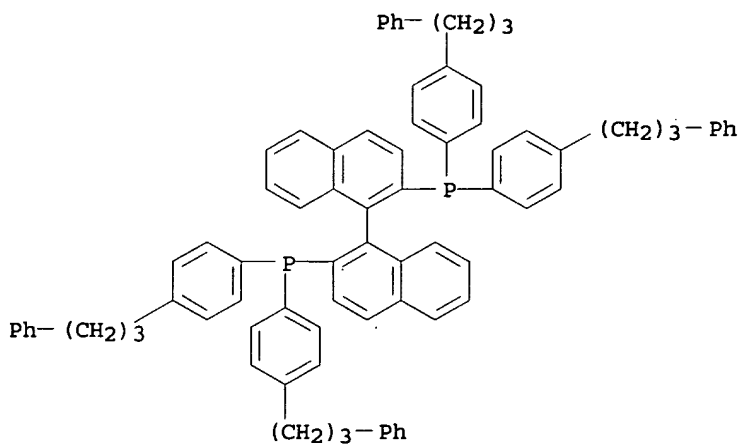
●4 Na

IT 196309-34-9P 261961-74-4P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP  
 (Preparation); RACT (Reactant or reagent)  
 (sulfonation; prepn. of aryl diphosphines as  
 ligands for transition metal  
 catalysts)

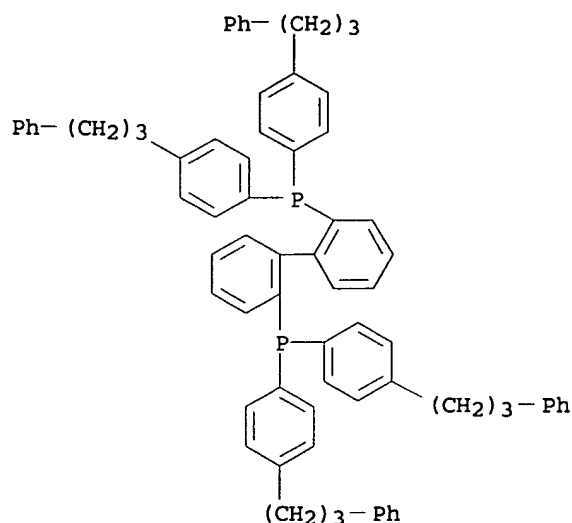
RN 196309-34-9 HCAPLUS

CN Phosphine, [1,1'-binaphthalene]-2,2'-diylbis[bis[4-(3-  
 phenylpropyl)phenyl]- (9CI) (CA INDEX NAME)



RN 261961-74-4 HCAPLUS

CN Phosphine, [1,1'-biphenyl]-2,2'-diylbis[bis[4-(3-  
 phenylpropyl)phenyl]- (9CI) (CA INDEX NAME)



IC ICM C07C047-02

INCL 568454000

CC 29-7 (Organometallic and Organometalloidal Compounds)

Section cross-reference(s): 23, 25, 67, 78

IT Transition metal complexes

RL: CAT (Catalyst use); FMU (Formation, unclassified);

FORM (Formation, nonpreparative); USES (Uses)

(aryl diphosphine; formation of transition metal complexes of aryl diphosphines in situ as hydroformylation and asym. hydrogenation catalysts)

IT Phosphines

RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)

(diphosphines; prepn. of aryl

diphosphines as ligands for transition

metal hydroformylation and hydrogenation catalysts)

IT 12092-47-6, Chloro(1,5-cyclooctadiene)rhodium dimer

RL: CAT (Catalyst use); USES (Uses)

(asym. hydrogenation of unsatd. compds. in presence of aryl diphosphine transition metal catalysts)

IT 14874-82-9, (Acetylacetonato)rhodium dicarbonyl

RL: CAT (Catalyst use); USES (Uses)

(hydroformylation of olefins in presence of aryl diphosphine transition metal catalysts)

IT 198490-82-3

RL: RCT (Reactant); RACT (Reactant or reagent)

(lithiation and redn.; prepn. of aryl

diphosphines as ligands for transition

metal catalysts)

IT 196309-32-7P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation);

RACT (Reactant or reagent)

(lithiation of; prepn. of aryl diphosphines

as ligands for transition metal

catalysts)

IT 14647-23-5

RL: CAT (Catalyst use); USES (Uses)

(phosphinylation of binaphthalene compd.)

IT 38274-14-5

RL: RCT (Reactant); RACT (Reactant or reagent)

(phosphinylation; prepn. of aryl diphosphines

as ligands for transition metal

catalysts)  
 IT 261961-72-2P 261961-75-5P 261969-19-1P  
 RL: CAT (Catalyst use); SPN (Synthetic preparation);  
 PREP (Preparation); USES (Uses)  
 (prepn. of aryl diphosphines as  
 ligands for transition metal  
 catalysts)  
 IT 196309-34-9P 261961-74-4P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP  
 (Preparation); RACT (Reactant or reagent)  
 (sulfonation; prepn. of aryl diphosphines as  
 ligands for transition metal  
 catalysts)

REFERENCE COUNT: 1 THERE ARE 1 CITED REFERENCES AVAILABLE FOR  
 THIS RECORD. ALL CITATIONS AVAILABLE IN  
 THE RE FORMAT

L26 ANSWER 43 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2000:53646 HCAPLUS

DOCUMENT NUMBER: 132:108101

TITLE: Biaryl phosphine and amine ligands for improved  
 transition metal-catalyzed processes

INVENTOR(S): Buchwald, Stephen; Old, David W.; Wolfe, John  
 P.; Palucki, Michael; Kamikawa, Ken; Chieffi,  
 Andrew; Sadighi, Joseph P.; Singer, Robert A.;  
 Ahman, Jens

PATENT ASSIGNEE(S): Massachusetts Institute of Technology, USA

SOURCE: PCT Int. Appl., 397 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 5

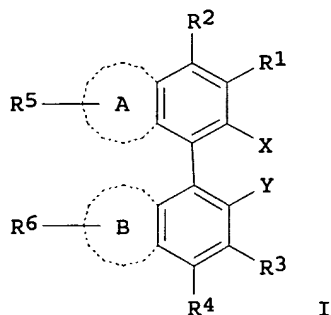
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2000002887	A2	20000120	WO 1999-US15450	19990709
WO 2000002887	A3	20000629		
W: CA, JP				
RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
US 6395916	B1	20020528	US 1998-113478	19980710
US 6307087	B1	20011023	US 1999-231315	19990113
US 6867310	B1	20050315	US 1999-239024	19990127
CA 2336691	AA	20000120	CA 1999-2336691	19990709
EP 1097158	A2	20010509	EP 1999-933785	19990709
EP 1097158	B1	20060125		

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC,  
 PT, IE, FI, CY  
 JP 2002520328 T2 20020709 JP 2000-559117

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	US 1998-196855	A	199811 20
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	US 1999-231315	A	199901 13
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	US 1999-239024	A	199901 27
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	US 1997-65970P	P	199711 20
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	WO 1999-US15450	W	199907 09

OTHER SOURCE(S): MARPAT 132:108101  
 GI



AB The present invention relates to the **prepn.** of novel biaryl **phosphine** and amine **ligands** (I) [wherein A and B = independently fused monocyclic or polycyclic cycloalkyl, cycloalkenyl, aryl, or heterocyclic rings of 4-8 atoms; X = NR<sub>2</sub>, PR<sub>2</sub>, AsR<sub>2</sub>, OR, or SR; Y = NR<sub>2</sub>, PR<sub>2</sub>, AsR<sub>2</sub>, OR, SR, SiR<sub>3</sub>, alkyl, or H; R-R<sub>6</sub> = independently H, halogen, (hetero)alkyl, alkenyl, alkynyl, hydroxy, alkoxy, silyloxy, amino, nitro, sulfhydryl, amide, carbonyl, ketone, anhydride, silyl, thioalkyl, ketone, ester, nitrile, (hetero)aryl, etc.] for **transition metals** and their use in **metal-catalyzed carbon-heteroatom and carbon-carbon bond-forming reactions**. Unexpected improvements over the prior art were demonstrated in **transition metal-catalyzed aryl amination reactions**, Suzuki couplings giving both biaryl and alkylaryl products, arylations and vinylations at the position  $\alpha$  to carbonyl groups, and carbon-oxygen bond formation. The **ligands** and methods of the invention enable transformations utilizing aryl chlorides and



bromides at room temp. at synthetically useful rates with extremely small amts. of catalyst relative to the limiting reagent. For example, coupling of p-chlorobenzonitrile and morpholine was catalyzed by 2.5 mol% Pd2(dba)3, 7.5 mol% of 2-(N,N-dimethylamino)-2'-(dicyclohexylphosphino)biphenyl, and NaOBu-t in DME at room temp. to provide 4-(4-morpholinyl)benzonitrile in 96% yield. Thus, the subject processes provide improvements in many features of the transition metal-catalyzed reactions, including the range of suitable substrates, reaction conditions, and efficiency.

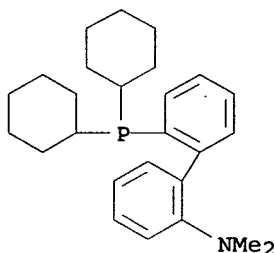
IT 213697-53-1P

RL: CAT (Catalyst use); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)

(prepd. catalyst; prepn. of biaryl phosphine and amine ligands for improved palladium-catalyzed amination reactions, Suzuki couplings, arylations, vinylations, and carbon-oxygen bond formation reactions)

RN 213697-53-1 HCAPLUS

CN [1,1'-Biphenyl]-2-amine, 2'-(dicyclohexylphosphino)-N,N-dimethyl- (9CI) (CA INDEX NAME)



IT 224311-51-7P, 2-(Di-tert-butylphosphino)biphenyl

224311-52-8P 224311-54-0P 224311-55-1P

251320-85-1P, 2-(Dicyclohexylphosphino)-2'-isopropylbiphenyl

251320-86-2P, 2-(Dicyclohexylphosphino)-2'-methylbiphenyl

255835-81-5P 255835-82-6P 255835-83-7P,

2-(Di-t-butylphosphino)-4'-(trifluoromethyl)biphenyl

255835-84-8P, 2-(Di-t-butylphosphino)-2'-(isopropyl)biphenyl

255836-32-9P 255836-65-8P 255836-67-0P

255836-68-1P, 1-[2-(Dicyclohexylphosphino)phenyl]naphthalene

255836-69-2P, 1-[2-(Di-t-butylphosphino)phenyl]naphthalene

255882-14-5P

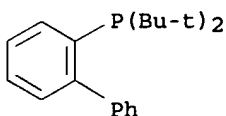
RL: CAT (Catalyst use); SPN (Synthetic preparation);

PREP (Preparation); USES (Uses)

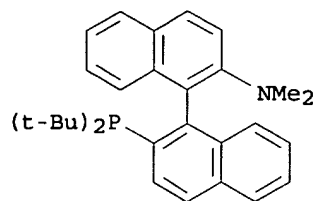
(prepd. catalyst; prepn. of biaryl phosphine and amine ligands for improved palladium-catalyzed amination reactions, Suzuki couplings, arylations, vinylations, and carbon-oxygen bond formation reactions)

RN 224311-51-7 HCAPLUS

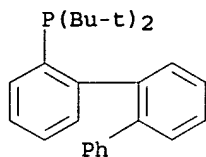
CN Phosphine, [1,1'-biphenyl]-2-ylbis(1,1-dimethylethyl)- (9CI) (CA INDEX NAME)



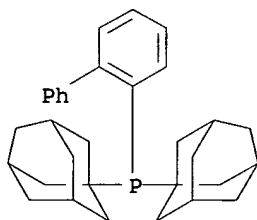
RN 224311-52-8 HCAPLUS

CN [1,1'-Binaphthalen]-2-amine, 2'-[bis(1,1-dimethylethyl)phosphino]-  
N,N-dimethyl- (9CI) (CA INDEX NAME)

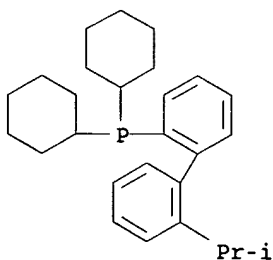
RN 224311-54-0 HCAPLUS

CN Phosphine, bis(1,1-dimethylethyl)[1,1':2',1''-terphenyl]-2-yl- (9CI)  
(CA INDEX NAME)

RN 224311-55-1 HCAPLUS

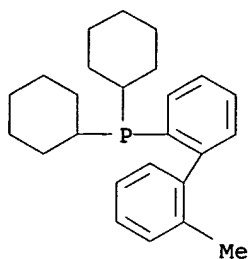
CN Phosphine, [1,1'-biphenyl]-2-ylbis(tricyclo[3.3.1.1<sup>3,7</sup>]dec-1-yl)-  
(9CI) (CA INDEX NAME)

RN 251320-85-1 HCAPLUS

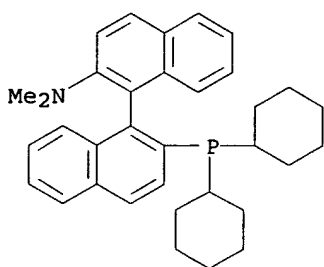
CN Phosphine, dicyclohexyl[2'-(1-methylethyl)[1,1'-biphenyl]-2-yl]-  
(9CI) (CA INDEX NAME)

RN 251320-86-2 HCAPLUS

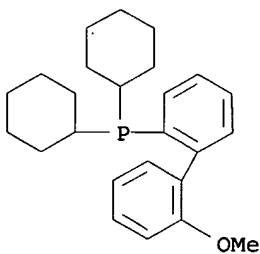
CN Phosphine, dicyclohexyl[2'-methyl[1,1'-biphenyl]-2-yl]- (9CI) (CA  
INDEX NAME)



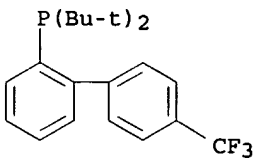
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 CN [1,1'-Binaphthalen]-2-amine, 2'-(dicyclohexylphosphino)-N,N-dimethyl-  
 (9CI) (CA INDEX NAME)



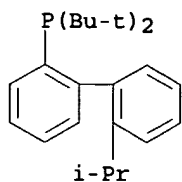
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 CN Phosphine, dicyclohexyl(2'-methoxy[1,1'-biphenyl]-2-yl)- (9CI) (CA  
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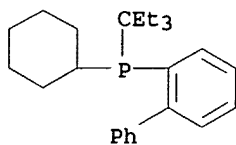
RN 255835-83-7 HCAPLUS  
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 biphenyl]-2-yl]- (9CI) (CA INDEX NAME)



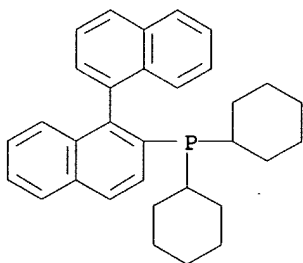
RN 255835-84-8 HCAPLUS  
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 2-yl]- (9CI) (CA INDEX NAME)



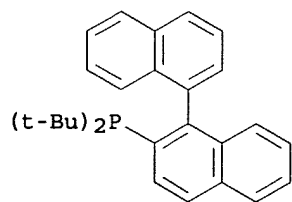
RN 255836-32-9 HCAPLUS  
 CN Phosphine, [1,1'-biphenyl]-2-ylcyclohexyl(1,1-diethylpropyl)- (9CI)  
 (CA INDEX NAME)



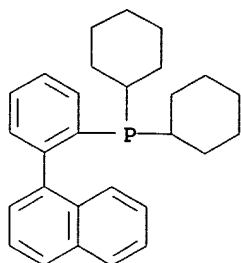
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 CN Phosphine, [1,1'-binaphthalen]-2-ylcyclohexyl- (9CI) (CA INDEX NAME)



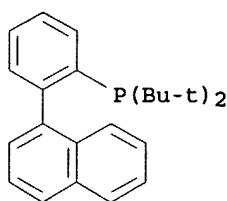
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 (CA INDEX NAME)



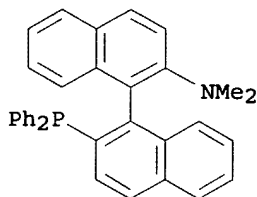
RN 255836-68-1 HCAPLUS  
 CN Phosphine, dicyclohexyl[2-(1-naphthalenyl)phenyl]- (9CI) (CA INDEX NAME)



RN 255836-69-2 HCAPLUS

CN Phosphine, bis(1,1-dimethylethyl)[2-(1-naphthalenyl)phenyl]- (9CI)  
(CA INDEX NAME)

RN 255882-14-5 HCAPLUS

CN [1,1'-Binaphthalen]-2-amine, 2'-(diphenylphosphino)-N,N-dimethyl-  
(9CI) (CA INDEX NAME)

IC ICM C07F009-02

CC 29-7 (Organometallic and Organometalloidal  
Compounds)

Section cross-reference(s): 25

ST biaryl phosphine ammine ligand prepn

transition metal catalyst; amination aryl chloride  
bromide palladium catalysts; Suzuki coupling aryl chloride bromide  
palladium catalysts; ketone arylation vinylation palladium  
catalysts; etherification palladium catalysts

IT Amines, preparation

RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP  
(Preparation); USES (Uses)(arom.; prepn. of biaryl phosphine and amine ligands for improved  
palladium-catalyzed amination reactions, Suzuki couplings,  
arylations, vinylation, and carbon-oxygen bond formation  
reactions)

IT Transition metal complexes

Transition metal complexes

RL: CAT (Catalyst use); USES (Uses)

(phosphine; prepn. of biaryl  
phosphine and amine ligands for improved  
palladium-catalyzed amination reactions, Suzuki couplings,  
arylations, vinylation, and carbon-oxygen bond formation)

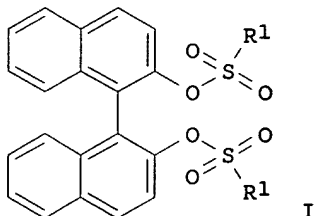
- reactions)
- IT Phosphines  
 RL: CAT (Catalyst use); USES (Uses)  
 (prepn. of biaryl phosphine and amine ligands for improved palladium-catalyzed amination reactions, Suzuki couplings, arylations, vinylations, and carbon-oxygen bond formation reactions)
- IT Biaryls  
 RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
 (prepn. of biaryl phosphine and amine ligands for improved palladium-catalyzed amination reactions, Suzuki couplings, arylations, vinylations, and carbon-oxygen bond formation reactions)
- IT Phosphines  
 Phosphines  
 RL: CAT (Catalyst use); USES (Uses)  
 (transition metal complexes; prepn. of biaryl phosphine and amine ligands for improved palladium-catalyzed amination reactions, Suzuki couplings, arylations, vinylations, and carbon-oxygen bond formation reactions)
- IT 534-17-8, Dicesium carbonate 3375-31-3, Diacetatopalladium 6476-37-5, Dicyclohexylphenylphosphine 14221-01-3, Tetrakis(triphenylphosphine)palladium 31570-04-4 51364-51-3, Tris(dibenzylideneacetone)dipalladium 54000-83-8, 2,6-Dimethoxyphenyl-di-t-butylphosphine 71042-54-1 74286-11-6 76189-56-5 91548-08-2 100165-88-6 133545-16-1 136779-28-7 139139-92-7 145964-33-6 149341-34-4 155806-35-2 213774-71-1 224311-49-3 247940-06-3 255837-14-0, 2,4,6-Trimethoxyphenyl-di-t-butylphosphine 255837-17-3 255837-19-5 255882-15-6 255882-16-7 255882-17-8 255882-18-9  
 RL: CAT (Catalyst use); USES (Uses)  
 (catalyst; prepn. of biaryl phosphine and amine ligands for improved palladium-catalyzed amination reactions, Suzuki couplings, arylations, vinylations, and carbon-oxygen bond formation reactions)
- IT 213697-53-1P  
 RL: CAT (Catalyst use); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)  
 (prepd. catalyst; prepn. of biaryl phosphine and amine ligands for improved palladium-catalyzed amination reactions, Suzuki couplings, arylations, vinylations, and carbon-oxygen bond formation reactions)
- IT 224311-51-7P, 2-(Di-tert-butylphosphino)biphenyl 224311-52-8P 224311-54-0P 224311-55-1P 251320-85-1P, 2-(Dicyclohexylphosphino)-2'-isopropylbiphenyl 251320-86-2P, 2-(Dicyclohexylphosphino)-2'-methylbiphenyl 255835-81-5P 255835-82-6P 255835-83-7P, 2-(Di-t-butylphosphino)-4'-(trifluoromethyl)biphenyl 255835-84-8P, 2-(Di-t-butylphosphino)-2'-(isopropyl)biphenyl 255835-85-9P 255836-32-9P 255836-65-8P 255836-67-0P 255836-68-1P, 1-[2-(Dicyclohexylphosphino)phenyl]naphthalene 255836-69-2P, 1-[2-(Di-t-butylphosphino)phenyl]naphthalene 255882-14-5P  
 RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
 (prepd. catalyst; prepn. of biaryl phosphine and amine ligands for improved palladium-catalyzed amination reactions, Suzuki couplings, arylations, vinylations, and carbon-oxygen bond formation reactions)

ACCESSION NUMBER: 2000:25637 HCAPLUS  
 DOCUMENT NUMBER: 132:78691  
 TITLE: Preparation of optically active  
 2,2'-bis(disubstituted as ligands for catalysts  
 INVENTOR(S): Kawashima, Masatoshi  
 PATENT ASSIGNEE(S): Kankyo Kagaku Center K. K., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

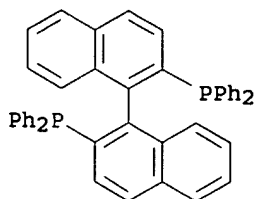
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2000007688	A2	20000111	JP 1998-171703	19980618

PRIORITY APPLN. INFO.: <--  
 JP 1998-171703  
 19980618

OTHER SOURCE(S): <--  
 CASREACT 132:78691; MARPAT 132:78691  
 GI



- AB Title compds. are prepd. by reaction of optically active 2,2'-dihydroxy-1,1'-binaphthyl sulfonates I (R1 = alkyl, perfluoroalkyl, aryl, perfluoroaryl) with ClPR2R3 (R2, R3 = aryl, cycloalkyl) in the presence of H<sub>2</sub>, amines, hydrogenation catalysts, and transition metal catalysts. Thus, (R)-2,2'-bis(trifluoromethanesulfonyloxy)-1,1'-binaphthyl was reacted with Ph<sub>2</sub>PCl in the presence of Pd/C, dichloro[1,2-bis(diphenylphosphino)ethane]nickel, and 1,4-diazabicyclo[2.2.2]octane, in DMF at 100° for 2 days to give 95% (R)-2,2'-bis(diphenylphosphino)-1,1'-binaphthyl.
- IT 76189-55-4P, (R)-2,2'-Bis(diphenylphosphino)-1,1'-binaphthyl  
 RL: IMF (Industrial manufacture); SPN (Synthetic preparation);  
 PREP (Preparation)  
 (prepn. of optically active bis(disubstituted phosphino)binaphthyls by condensation of bis(sulfonyloxy)binaphthyls with chlorophosphines)
- RN 76189-55-4 HCAPLUS  
 CN Phosphine, (1R)-[1,1'-binaphthalene]-2,2'-diylbis[diphenyl- (9CI)  
 (CA INDEX NAME)



- IC ICM C07F009-50  
ICS B01J031-28; C07B053-00; C07B061-00; C07M007-00
- CC 29-7 (Organometallic and Organometalloidal Compounds)  
Section cross-reference(s): 67
- ST optically active phosphinobinaphthyl **prepn** catalyst  
**ligand**; sulfonyloxybinaphthyl condensation  
**chlorophosphine** palladium catalyst; **transition**  
**metal** catalyst condensation sulfonyloxybinaphthyl  
**chlorophosphine**; amine condensation sulfonyloxybinaphthyl  
**chlorophosphine**; nickel catalyst azabicyclooctane  
condensation sulfonyloxybinaphthyl **chlorophosphine**
- IT Transition metals, uses  
RL: **CAT (Catalyst use)**; USES (Uses)  
(catalysts; **prepn.** of optically active bis(disubstituted  
phosphino)binaphthyls by condensation of  
bis(sulfonyloxy)binaphthyls with chlorophosphines)
- IT Ligands  
RL: **CAT (Catalyst use)**; USES (Uses)  
(**prepn.** of optically active bis(disubstituted  
phosphino)binaphthyls for catalyst ligands)
- IT 1295-35-8, Bis( $\eta$ 4-1,5-cyclooctadiene)nickel 14647-23-5,  
Dichloro[1,2-bis(diphenylphosphino)ethane]nickel  
RL: **CAT (Catalyst use)**; USES (Uses)  
(catalyst; **prepn.** of optically active bis(disubstituted  
phosphino)binaphthyls by condensation of  
bis(sulfonyloxy)binaphthyls with chlorophosphines)
- IT 7440-44-0, Carbon, uses  
RL: **CAT (Catalyst use)**; USES (Uses)  
(hydrogenation catalyst support for Pd; **prepn.** of optically  
active bis(disubstituted phosphino)binaphthyls by condensation of  
bis(sulfonyloxy)binaphthyls with chlorophosphines)
- IT 7440-05-3, Palladium, uses  
RL: **CAT (Catalyst use)**; USES (Uses)  
(hydrogenation catalyst; **prepn.** of optically active  
bis(disubstituted phosphino)binaphthyls by condensation of  
bis(sulfonyloxy)binaphthyls with chlorophosphines)
- IT **76189-55-4P**, (R)-2,2'-Bis(diphenylphosphino)-1,1'-binaphthyl  
RL: IMF (Industrial manufacture); SPN (Synthetic preparation);  
**PREP (Preparation)**  
(**prepn.** of optically active bis(disubstituted  
phosphino)binaphthyls by condensation of  
bis(sulfonyloxy)binaphthyls with chlorophosphines)

L26 ANSWER 45 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 1999:468097 HCAPLUS  
DOCUMENT NUMBER: 131:88050  
TITLE: Process for preparing diphosphines ligands and  
catalysts containing the same  
INVENTOR(S): Kohlpaintner, Christian W.; Hanson, Brian E.;  
Ding, Hao  
PATENT ASSIGNEE(S): Celanese International Corp., USA  
SOURCE: U.S., 15 pp.  
CODEN: USXXAM  
DOCUMENT TYPE: Patent  
LANGUAGE: English



FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

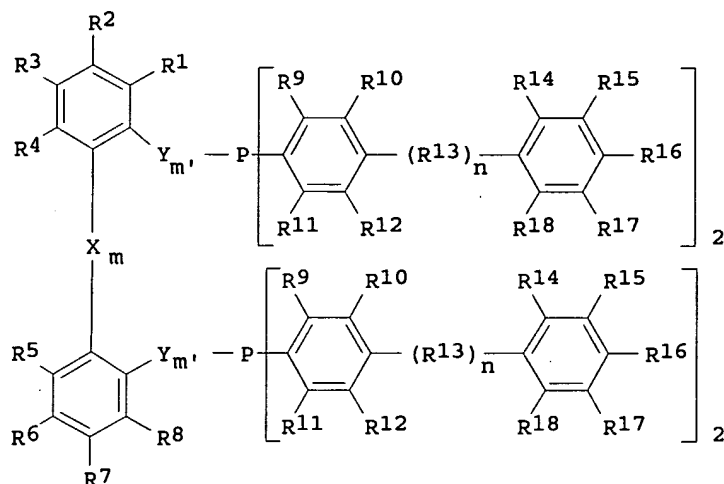
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 5929273	A	19990727	US 1996-634534	19960418

PRIORITY APPLN. INFO.:

US 1996-634534

19960418

OTHER SOURCE(S): MARPAT 131:88050  
GI



I

AB The present invention provides novel water-sol. diphosphines I [X, Y = each independently selected from the group consisting of alkyl C1-20, alkenyl C1-20, alkynyl C1-20, Ph, naphthyl, -NR- (R = H, alkyl C1-20, phenyl), O, S; m, m' = 0-1; R1-R8 = each independently selected from the group consisting of H, halo, nitro, amino, alkyl C1-20, alkoxy, OH, -C(O)-OR, -CN, SOM, -N-(R)X- (X = halide), and aryl; R1 and R2, R2 and R3, R3 and R4, R5 and R6, R6 and R7, R7 and R8 may also (in addn. to the above) from a cyclic ring contg. a total of 2 to 6 atoms selected from the group consisting of carbon, oxygen, nitrogen, sulfur, and mixts. thereof, with the proviso that said ring can be substituted or unsubstituted; R9-R12 and R14-R18 = each independently selected from the group consisting of H, halo, -SOM, M = alkali, alk. earth metals, and N(R) (R = H, alkyl C1-20, phenyl), alkyl C1-20, -COM, -N+(R)3X- (X = halide), -CN, -OR, -C(O)-OR, and -P(R)2, where R = H, alkyl C1-20, phenyl; R13 = group consisting of a straight chain or branched chain alkyl C1-20, alkynyl C1-20, alkenyl C1-20, Ph, naphthyl, anthracyl, and substituted Ph, naphthyl, and anthryl; n = 0-20]. A process for prepg. an aryl diphosphine complexed with a transition metal to form a novel catalyst useful in such applications as hydroformylation.

Thus, prepn. of I ( $X_m, Y_m' = -, R_1-R_{12} = H, R_{13} = CH_2, n = 3$ ) was prepd. in three steps starting from p-(3-phenylpropyl)phenyllithium, the diphosphine was used as cocatalyst for palladium catalyzed hydroformylation of 1-octene.

IT 196309-35-0P 229956-59-6P 229963-58-0P

RL: CAT (Catalyst use); SPN (Synthetic preparation);

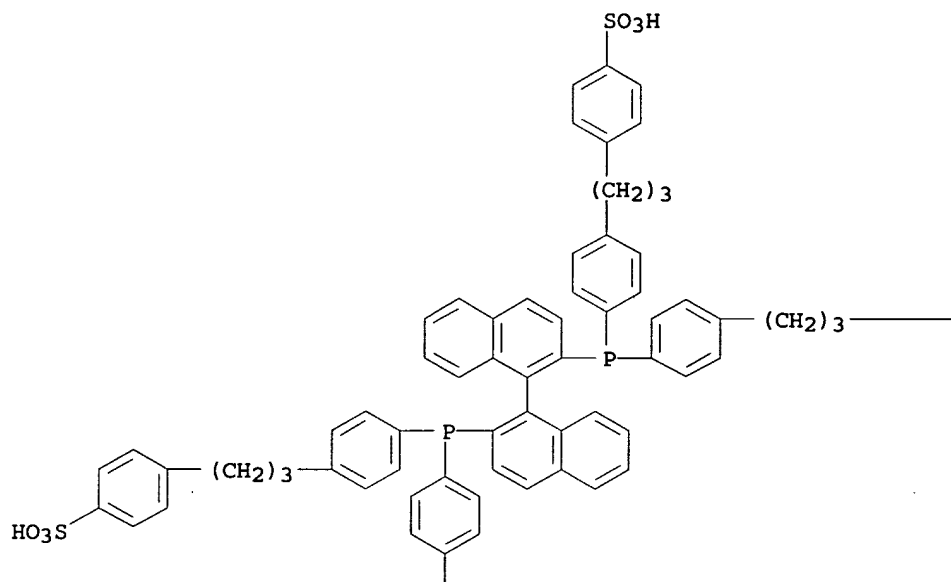
PREP (Preparation); USES (Uses)

(process for prepg. water sol. diphosphines  
ligands and catalysts contg. same)

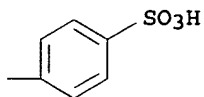
RN 196309-35-0 HCAPLUS

CN Benzenesulfonic acid, 4,4',4'',4'''-[[[1,1'-binaphthalene]-2,2'-diylbis[phosphinidynebis(4,1-phenylene-3,1-propanediyl)]]]tetrakis-, tetrasodium salt (9CI) (CA INDEX NAME)

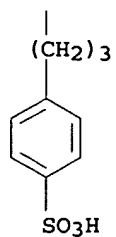
PAGE 1-A



PAGE 1-B



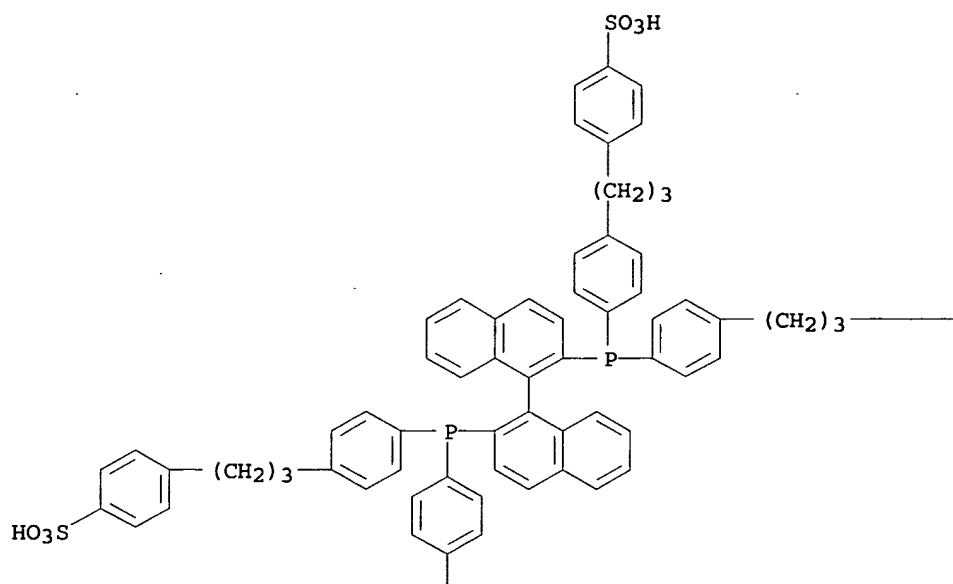
PAGE 2-A



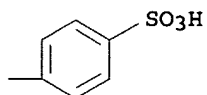
●4 Na

RN 229956-59-6 HCAPLUS  
 CN Benzenesulfonic acid, 4,4',4'',4'''-[[[1,1'-binaphthalene]-2,2'-diylbis[phosphinidynebis(4,1-phenylene-3,1-propanediyl)]]]tetrakis-(9CI) (CA INDEX NAME)

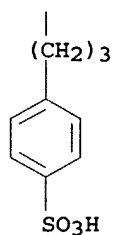
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PAGE 1-B

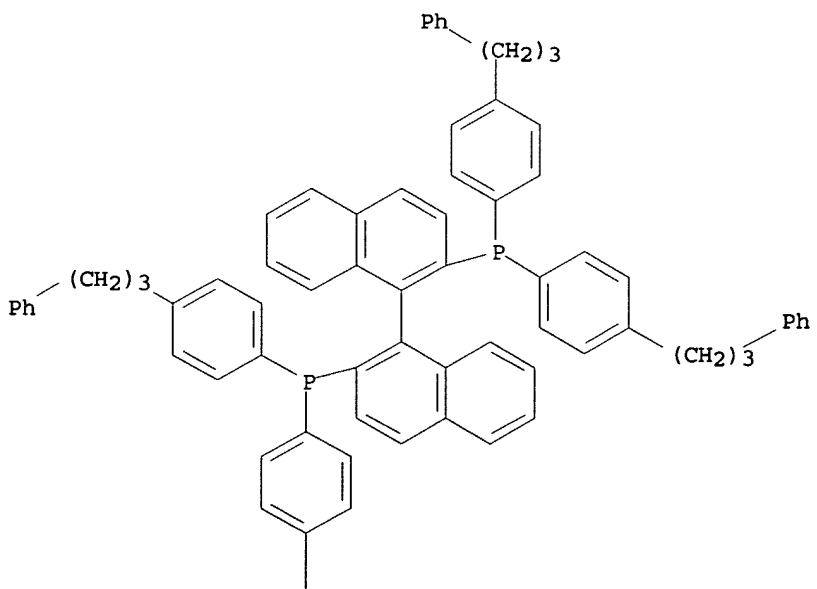


PAGE 2-A

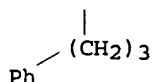


RN 229963-58-0 HCAPLUS  
CN Phosphine, (1S)-[1,1'-binaphthalene]-2,2'-diylbis[bis(4-(3-phenylpropyl)phenyl)- (9CI) (CA INDEX NAME)]

PAGE 1-A



PAGE 2-A



IC ICM C07F009-50

INCL 562035000

CC 29-7 (Organometallic and Organometalloidal Compounds)

Section cross-reference(s): 21, 67

IT 196309-35-0P 196309-36-1P 229956-59-6P

229956-60-9P 229963-58-0P

RL: CAT (Catalyst use); SPN (Synthetic preparation);

PREP (Preparation); USES (Uses)

(process for prepg. water sol. diphosphines ligands and catalysts contg. same)

REFERENCE COUNT: 1 THERE ARE 1 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L26 ANSWER 46 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1999:345764 HCAPLUS

DOCUMENT NUMBER: 131:58650

TITLE: Preparation of optically active phosphines supported on solids as ligands for palladium asymmetric reaction catalysts

INVENTOR(S): Uozumi, Hiroyasu; Hayashi, Tamio

PATENT ASSIGNEE(S): Nissan Chemical Industries, Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 14 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 11147890	A2	19990602	JP 1997-313964	19971114

PRIORITY APPLN. INFO.:

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JP 1997-313964

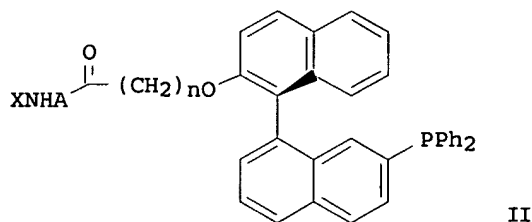
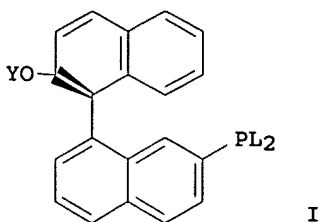
19971114

OTHER SOURCE(S):

MARPAT 131:58650

GI

&lt;--

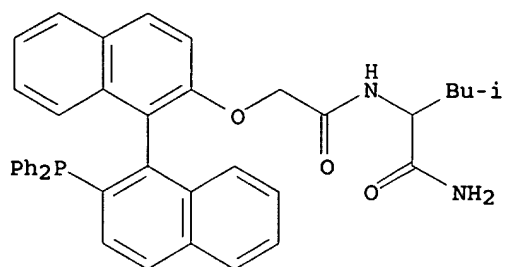


AB Title compds. I ( $Y = (CH_2)_nCOANHX$ ;  $XNH$  = residue of resin terminated with amino group;  $A$  = (protected) L- or D-amino acid;  $n = 1-5$ ) and II ( $XNH$ ,  $A$ ,  $n$  = same as I) are prepd. TentaGel S-NH<sub>2</sub> was condensed with Fmoc-L-valine in the presence of 1-(3-dimethylaminopropyl)-3-ethylcarbodiimide hydrochloride and N-hydroxybenzotriazole in DMF at room temp. for 2 h, deprotected with piperidine/DMF, and condensed with I ( $Y = HO_2CCH_2$ ) in the presence of 1-(3-dimethylaminopropyl)-3-ethylcarbodiimide hydrochloride in DMF for 9 h to give a phosphine supported on a polymer. 1,3-Diphenyl-3-acetoxy-1-propene was reacted with 3-methyl-2,4-pentanedione in the presence of aq. K<sub>2</sub>CO<sub>3</sub> and a catalyst prepd. from the phosphine and  $[\pi-C_3H_5PCl_2]$  at room temp. for 12 h to give 49%  $PhCH:CHCHPhCMe(COMe)_2$  with 78% e.e.

IT 227750-52-9DP, polymer-supported 227750-53-0DP,  
 polymer-supported 227750-54-1DP, polymer-supported  
 227753-90-4DP, polymer-supported 227753-91-5DP,  
 polymer-supported 227753-92-6DP, polymer-supported  
 227753-93-7DP, polymer-supported 227753-94-8DP,  
 polymer-supported 227753-95-9DP, polymer-supported  
 227753-96-0DP, polymer-supported 227753-97-1DP,  
 polymer-supported 227753-98-2DP, polymer-supported  
 RL: CAT (Catalyst use); SPN (Synthetic preparation);  
 PREP (Preparation); USES (Uses)  
 (prepn. of optically active phosphines  
 supported on solids as ligands for palladium asym.  
 reaction catalysts)

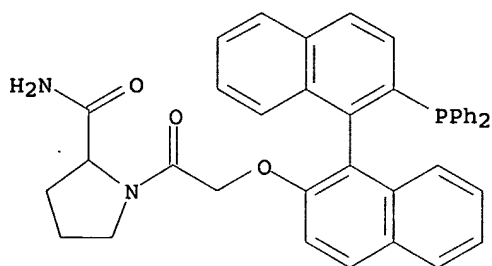
RN 227750-52-9 HCAPLUS

CN Pentanamide, 2-[[[(1R)-2'-(diphenylphosphino)[1,1'-binaphthalen]-2-yl]oxy]acetyl]amino]-4-methyl-, (2S)- (9CI) (CA INDEX NAME)



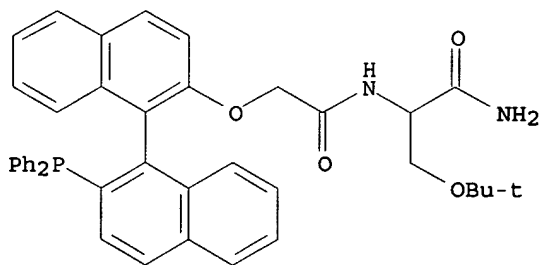
RN 227750-53-0 HCAPLUS

CN 2-Pyrrolidinecarboxamide, 1-[[[(1R)-2'-(diphenylphosphino)[1,1'-binaphthalen]-2-yl]oxy]acetyl]-, (2R)- (9CI) (CA INDEX NAME)



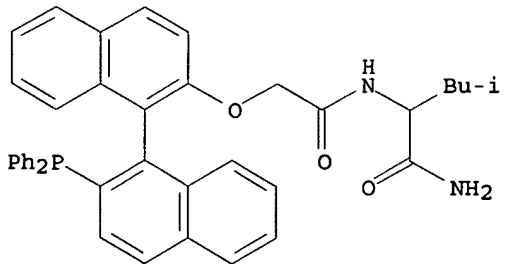
RN 227750-54-1 HCAPLUS

CN Propanamide, 3-(1,1-dimethylethoxy)-2-[[[(1R)-2'-(diphenylphosphino)[1,1'-binaphthalen]-2-yl]oxy]acetyl]amino]-, (2S)- (9CI) (CA INDEX NAME)



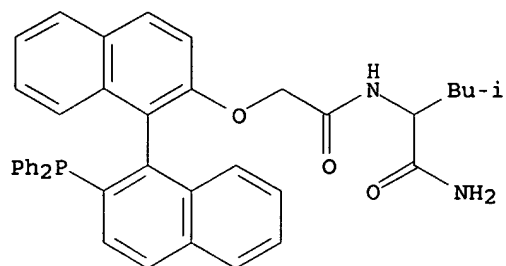
RN 227753-90-4 HCAPLUS

CN Pentanamide, 2-[[[(1R)-2'-(diphenylphosphino)[1,1'-binaphthalen]-2-yl]oxy]acetyl]amino]-4-methyl-, (2R)- (9CI) (CA INDEX NAME)



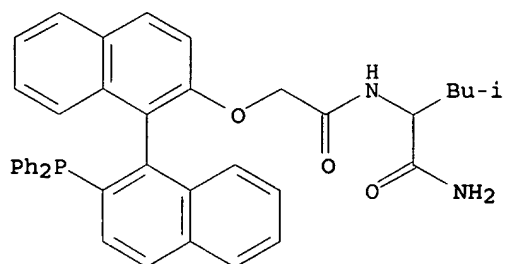
RN 227753-91-5 HCAPLUS

CN Pentanamide, 2-[[[(1S)-2'-(diphenylphosphino)[1,1'-binaphthalen]-2-yl]oxy]acetyl]amino]-4-methyl-, (2R)- (9CI) (CA INDEX NAME)



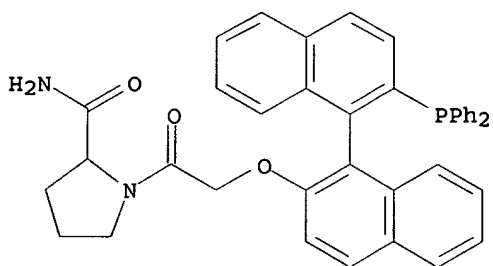
RN 227753-92-6 HCAPLUS

CN Pentanamide, 2-[[[(1S)-2'-(diphenylphosphino)[1,1'-binaphthalen]-2-yl]oxy]acetyl]amino]-4-methyl-, (2S)- (9CI) (CA INDEX NAME)



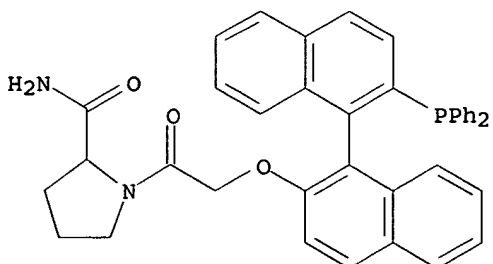
RN 227753-93-7 HCAPLUS

CN 2-Pyrrolidinecarboxamide, 1-[[[(1S)-2'-(diphenylphosphino)[1,1'-binaphthalen]-2-yl]oxy]acetyl]-, (2R)- (9CI) (CA INDEX NAME)



RN 227753-94-8 HCAPLUS

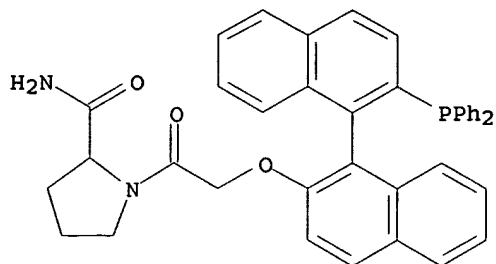
CN 2-Pyrrolidinecarboxamide, 1-[[[(1R)-2'-(diphenylphosphino)[1,1'-binaphthalen]-2-yl]oxy]acetyl]-, (2S)- (9CI) (CA INDEX NAME)





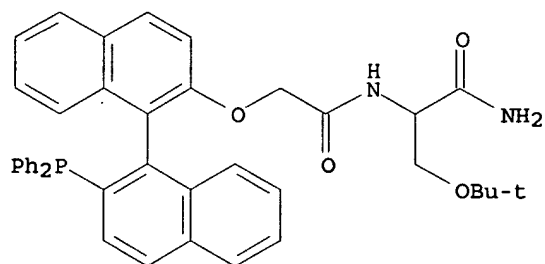
RN 227753-95-9 HCAPLUS

CN 2-Pyrrolidinecarboxamide, 1-[[[(1S)-2'-(diphenylphosphino)[1,1'-binaphthalen]-2-yl]oxy]acetyl]-, (2S)- (9CI) (CA INDEX NAME)



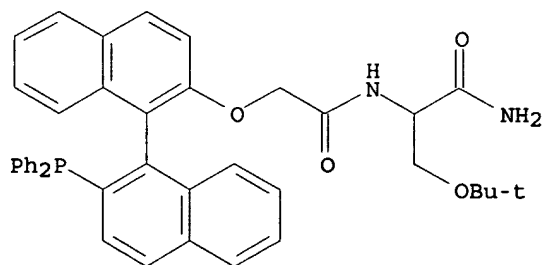
RN 227753-96-0 HCAPLUS

CN Propanamide, 3-(1,1-dimethylethoxy)-2-[[[(1S)-2'-(diphenylphosphino)[1,1'-binaphthalen]-2-yl]oxy]acetyl]amino]-, (2S)- (9CI) (CA INDEX NAME)



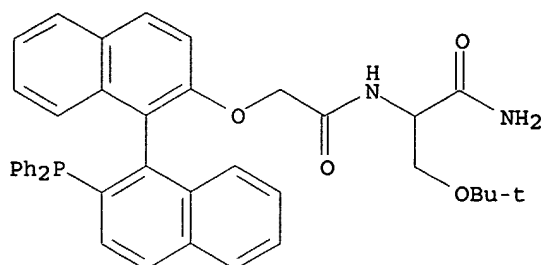
RN 227753-97-1 HCAPLUS

CN Propanamide, 3-(1,1-dimethylethoxy)-2-[[[(1R)-2'-(diphenylphosphino)[1,1'-binaphthalen]-2-yl]oxy]acetyl]amino]-, (2R)- (9CI) (CA INDEX NAME)



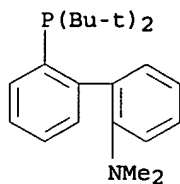
RN 227753-98-2 HCAPLUS

CN Propanamide, 3-(1,1-dimethylethoxy)-2-[[[(1S)-2'-(diphenylphosphino)[1,1'-binaphthalen]-2-yl]oxy]acetyl]amino]-, (2R)- (9CI) (CA INDEX NAME)

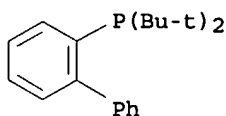


- IC ICM C07F009-50  
ICS B01J031-24; C07M007-00
- CC 25-16 (Benzene, Its Derivatives, and Condensed Benzenoid Compounds)  
Section cross-reference(s): 29, 38, 67
- IT 227750-52-9DP, polymer-supported 227750-53-0DP,  
polymer-supported 227750-54-1DP, polymer-supported  
227753-90-4DP, polymer-supported 227753-91-5DP,  
polymer-supported 227753-92-6DP, polymer-supported  
227753-93-7DP, polymer-supported 227753-94-8DP,  
polymer-supported 227753-95-9DP, polymer-supported  
227753-96-0DP, polymer-supported 227753-97-1DP,  
polymer-supported 227753-98-2DP, polymer-supported  
RL: CAT (Catalyst use); SPN (Synthetic preparation);  
PREP (Preparation); USES (Uses)  
(prepn. of optically active phosphines  
supported on solids as ligands for palladium asym.  
reaction catalysts)
- L26 ANSWER 47 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN
- ACCESSION NUMBER: 1999:261305 HCAPLUS  
DOCUMENT NUMBER: 130:337883  
TITLE: Novel electron-rich bulky phosphine ligands  
facilitate the palladium-catalyzed preparation  
of diaryl ethers
- AUTHOR(S): Aranyos, Attila; Old, David W.; Kiyomori, Ayumu;  
Wolfe, John P.; Sadighi, Joseph P.; Buchwald,  
Stephen L.
- CORPORATE SOURCE: Department of Chemistry, Massachusetts Institute  
of Technology, Cambridge, MA, 02139, USA
- SOURCE: Journal of the American Chemical Society (  
1999), 121(18), 4369-4378  
CODEN: JACSAT; ISSN: 0002-7863
- PUBLISHER: American Chemical Society
- DOCUMENT TYPE: Journal
- LANGUAGE: English
- OTHER SOURCE(S): CASREACT 130:337883
- AB A general method for the palladium-catalyzed formation of diaryl  
ethers, e.g., PhOC6H4COMe-4, is described. Electron-rich, bulky  
aryldialkylphosphine ligands, e.g., 2-PhC6H4P(CMe3)2, in which the  
two alkyl groups are either tert-Bu or 1-adamantyl, are the key to  
the success of the transformation. A wide range of  
electron-deficient, electronically neutral and electron-rich aryl  
bromides, chlorides, and triflates can be combined with a variety of  
phenols with the use of sodium hydride or potassium phosphate as  
base in toluene at 100°C. The bulky yet basic nature of the  
phosphine ligand is thought to be responsible for increasing the  
rate of reductive elimination of the diaryl ether from palladium.
- IT 224311-49-3P 224311-51-7P 224311-52-8P  
224311-54-0P 224311-55-1P  
RL: CAT (Catalyst use); SPN (Synthetic preparation);  
PREP (Preparation); USES (Uses)  
(prepn. of diaryl ethers using palladium catalyst and  
phosphine ligands)

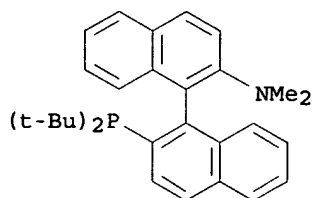
RN 224311-49-3 HCAPLUS  
 CN [1,1'-Biphenyl]-2-amine, 2'-[bis(1,1-dimethylethyl)phosphino]-N,N-dimethyl- (9CI) (CA INDEX NAME)



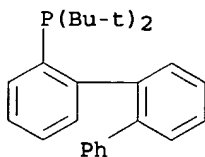
RN 224311-51-7 HCAPLUS  
 CN Phosphine, [1,1'-biphenyl]-2-ylbis(1,1-dimethylethyl)- (9CI) (CA INDEX NAME)



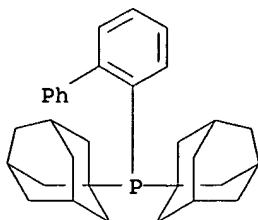
RN 224311-52-8 HCAPLUS  
 CN [1,1'-Binaphthalen]-2-amine, 2'-[bis(1,1-dimethylethyl)phosphino]-N,N-dimethyl- (9CI) (CA INDEX NAME)



RN 224311-54-0 HCAPLUS  
 CN Phosphine, bis(1,1-dimethylethyl)[1,1':2',1''-terphenyl]-2-yl- (9CI) (CA INDEX NAME)



RN 224311-55-1 HCAPLUS  
 CN Phosphine, [1,1'-biphenyl]-2-ylbis(tricyclo[3.3.1.1.3,7]dec-1-yl)- (9CI) (CA INDEX NAME)



CC 25-9 (Benzene, Its Derivatives, and Condensed Benzenoid Compounds)  
 IT 224311-49-3P 224311-51-7P 224311-52-8P  
 224311-54-0P 224311-55-1P

RL: CAT (Catalyst use); SPN (Synthetic preparation);

PREP (Preparation); USES (Uses)

(prepn. of diaryl ethers using palladium catalyst and  
 phosphine ligands)

REFERENCE COUNT: 67 THERE ARE 67 CITED REFERENCES AVAILABLE  
 FOR THIS RECORD. ALL CITATIONS AVAILABLE  
 IN THE RE FORMAT

L26 ANSWER 48 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1998:774394 HCAPLUS

DOCUMENT NUMBER: 130:139441

TITLE: Preparation of novel chiral phosphorus ylides  
 and their palladium, rhodium and ruthenium  
 complexes

AUTHOR(S): Ohta, Tetsuo; Fujii, Takeshi; Kurahashi,

Nobukazu; Sasayama, Hiroyuki; Furukawa, Isao

CORPORATE SOURCE: Dep. Mol. Sci. Technol., Doshisha Univ., Kyoto,  
 610-0394, Japan

SOURCE: Science and Engineering Review of Doshisha  
 University (1998), 39(3), 133-141

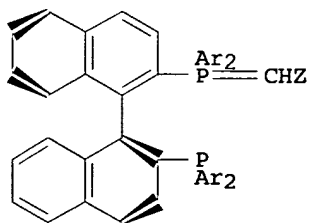
CODEN: DDRKAZ; ISSN: 0036-8172

PUBLISHER: Doshisha University, Science and Engineering  
 Research Institute

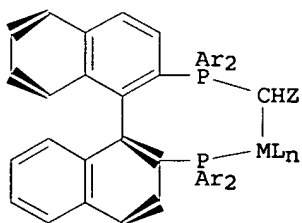
DOCUMENT TYPE: Journal

LANGUAGE: Japanese

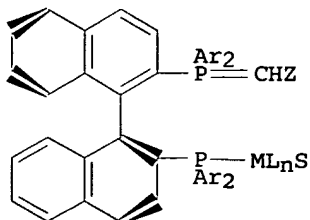
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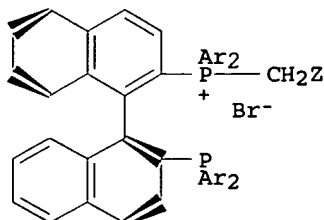
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II



III



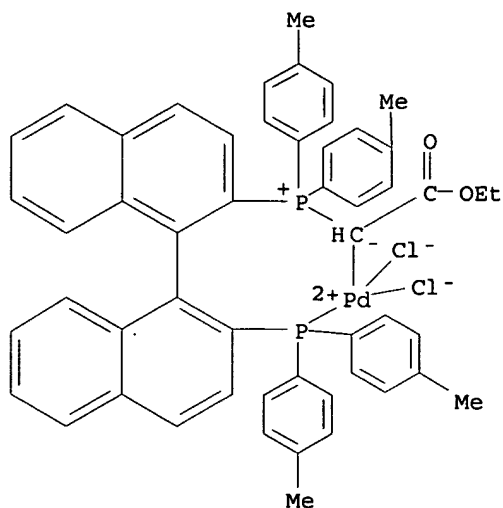
IV

AB New types of carbonyl- and cyano-stabilized chiral monoylides of TolBINAP (2,2'-bis(di(4-methylphenyl)phosphino)-1,1'-binaphthyl) (I; Ar = 4-MeC<sub>6</sub>H<sub>4</sub>; Z = CO<sub>2</sub>Et, CO<sub>2</sub>Me<sub>3</sub>, cyano) and their palladium, rhodium and ruthenium complexes [II or III; ML<sub>n</sub> = PdCl<sub>2</sub>, Pd(dba), PhCl(cod), RuBr<sub>2</sub>(p-cymene); Ar, Z = same as above] were **prepd.** and characterized by means of IR, <sup>1</sup>H and <sup>31</sup>P NMR spectra. **Monophosphine-monophosphonium salts** (IV; Ar, Z = same as above) were **prepd.** by the reaction of TolBINAP with BrCH<sub>2</sub>CO<sub>2</sub>R (R CH<sub>2</sub>CH<sub>3</sub>, C(CH<sub>3</sub>)<sub>3</sub>) or BrCH<sub>2</sub>CN without solvent. These salts were converted to the corresponding **monophosphine-monoylides** (YLIPHOS) by treatment with methylolithium. Simple mixing of YLIPHOS and **transition metal precursors**, such as PdCl<sub>2</sub>(PhCN)<sub>2</sub>, Pd<sub>2</sub>(dba)<sub>3</sub>(CHCl<sub>3</sub>), [RhCl(cod)]<sub>2</sub>, [RuBr<sub>2</sub>(p-cymene)]<sub>2</sub> afforded YLIPHOS-**Metal** complexes. <sup>31</sup>P NMR spectra of YLIPHOS-Rh complex exhibited that one phosphorus atom coordinated to the **metal** center and another did not attach directly to Rh according to the Rh-P coupling consts. The νC=O frequencies of the ester group of the complexes exhibited blue shifts relative to those of the free ylides, and <sup>1</sup>H NMR data for the complexes revealed a downfield shift of the methine proton resonances relative to those of the free ylides. These observations suggested that YLIPHOS **ligands** coordinate to the **metal** center through the methine carbon atom of the ylide and the phosphorus atom of **phosphine**. At the same time, the complexes are considered to be an equil. mixt. of bidentate coordination II and monodentate coordination III of the YLIPHOS **ligand** to the **metal** center. YLIPHOS-Pd complexes showed catalytic activities for the coupling reaction of aryl halide and the Grignard reagent. Though the asym. induction was not satisfactory, this is the first example of the use of chiral ylide complexes for the asym. catalysis, and it is expected to develop new asym. reactions catalyzed by YLIPHOS complexes.

IT 220119-48-2P 220119-50-6P 220119-51-7P  
220119-52-8P 220119-53-9P 220119-55-1P  
220119-57-3P 220119-63-1P  
RL: CAT (Catalyst use); SPN (Synthetic preparation);  
PREP (Preparation); USES (Uses)  
(prepn. of novel chiral phosphorus ylides and their palladium, rhodium and ruthenium complexes as catalysts for asym. induction)

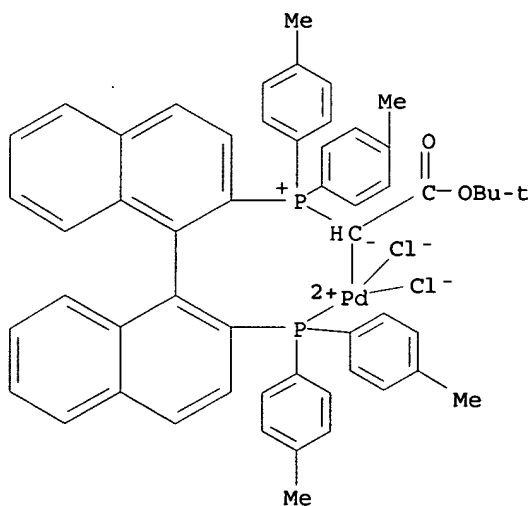
RN 220119-48-2 HCAPLUS

CN Palladium, [[2'-[bis(4-methylphenyl)phosphino-κP][1,1'-binaphthalen]-2-yl]bis(4-methylphenyl)phosphonium (1-η)-2-ethoxy-2-oxoethylide]dichloro-, (SP-4-3)- (9CI) (CA INDEX NAME)



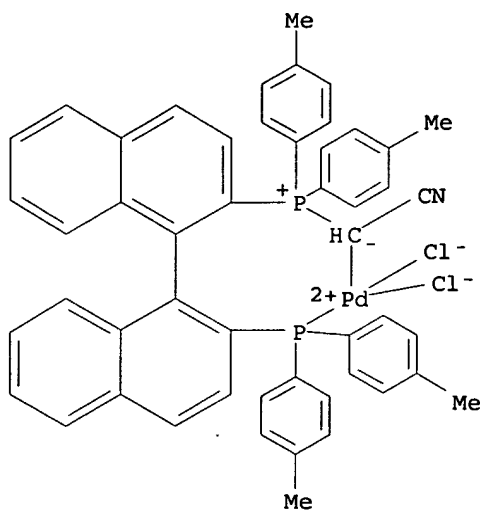
RN 220119-50-6 HCAPLUS

CN Palladium, [[2'-[bis(4-methylphenyl)phosphino-κP][1,1'-binaphthalen]-2-yl]bis(4-methylphenyl)phosphonium (1-η)-2-(1,1-dimethylethoxy)-2-oxoethylide]dichloro-, (SP-4-3)-(9CI) (CA INDEX NAME)



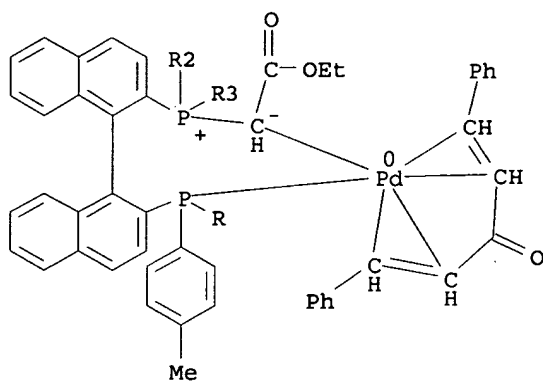
RN 220119-51-7 HCAPLUS

CN Palladium, [[2'-[bis(4-methylphenyl)phosphino-κP][1,1'-binaphthalen]-2-yl]bis(4-methylphenyl)phosphonium (1-η)-cyanomethylide]dichloro-, (SP-4-3)-(9CI) (CA INDEX NAME)

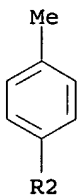
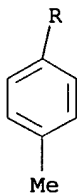


RN 220119-52-8 HCAPLUS  
 CN Palladium, [[2'-[bis(4-methylphenyl)phosphino-κP] [1,1'-binaphthalen]-2-yl]bis(4-methylphenyl)phosphonium (1-η)-2-ethoxy-2-oxoethylide] [(1,2,4,5-η)-1,5-diphenyl-1,4-pentadien-3-one]- (9CI) (CA INDEX NAME)

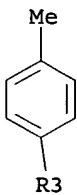
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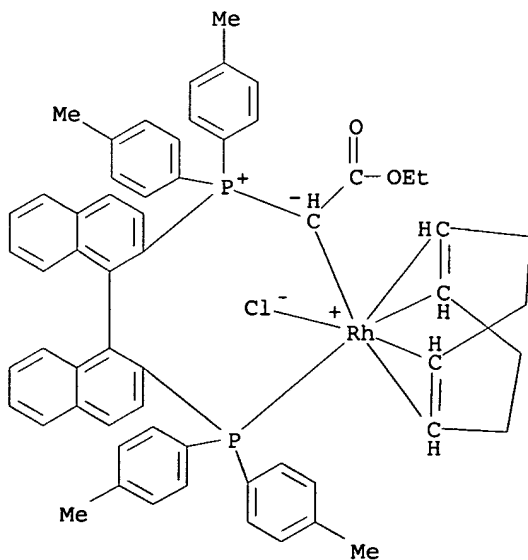
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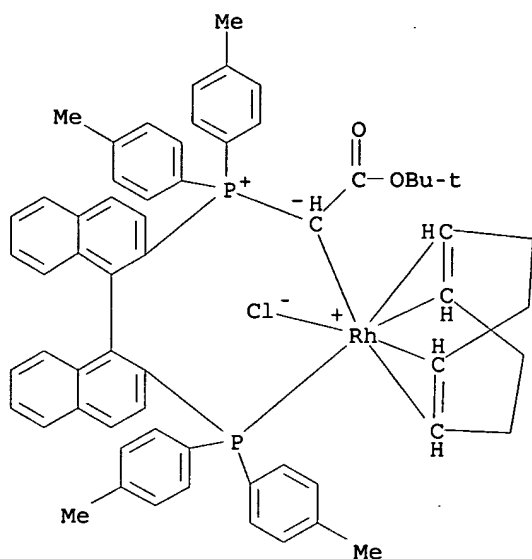


RN 220119-53-9 HCAPLUS  
 CN Rhodium, [[2'-[bis(4-methylphenyl)phosphino-κP][1,1'-binaphthalen]-2-yl]bis(4-methylphenyl)phosphonium (1-η)-2-ethoxy-2-oxoethylidene]chloro[(1,2,5,6-η)-1,5-cyclooctadiene]- (9CI) (CA INDEX NAME)

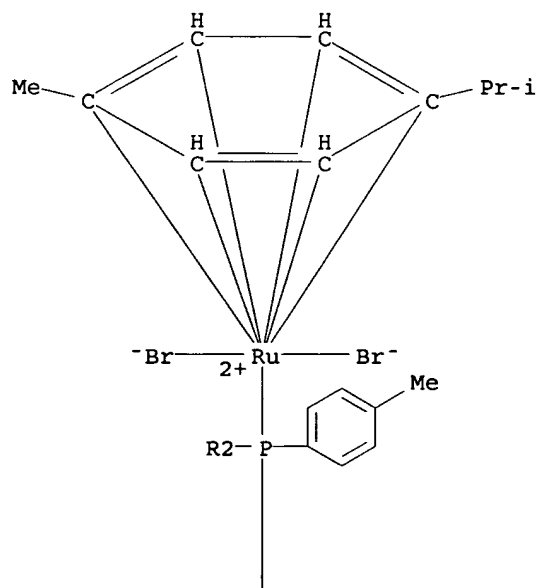




RN 220119-55-1 HCAPLUS  
 CN Rhodium, [[2'-[bis(4-methylphenyl)phosphino-κP][1,1'-binaphthalen]-2-yl]bis(4-methylphenyl)phosphonium (1-η)-2-(1,1-dimethylethoxy)-2-oxoethylidene]chloro[(1,2,5,6-η)-1,5-cyclooctadiene]- (9CI) (CA INDEX NAME)

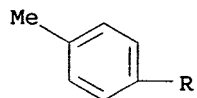
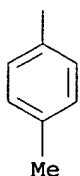


RN 220119-57-3 HCAPLUS  
 CN Ruthenium, [[[(1S)-2'-[bis(4-methylphenyl)phosphino-κP][1,1'-binaphthalen]-2-yl]bis(4-methylphenyl)phosphoranylidene]acetonitrile]dibromo[(1,2,3,4,5,6-η)-1-methyl-4-(1-methylethyl)benzene]- (9CI) (CA INDEX NAME)

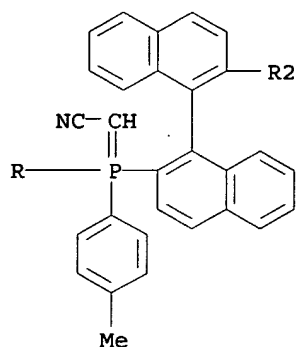


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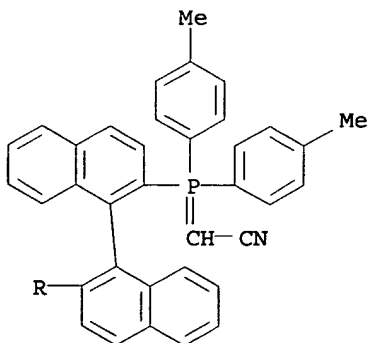


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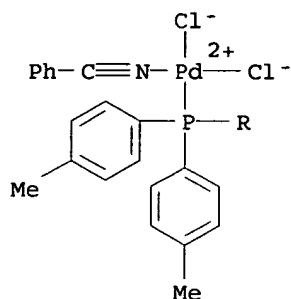


RN 220119-63-1 HCAPLUS  
 CN Palladium, (benzonitrile) [(((1S)-2'-[bis(4-methylphenyl)phosphino- $\kappa$ P] [1,1'-binaphthalen]-2-yl]bis(4-methylphenyl)phosphoranylidene]acetonitrile]dichloro-, (SP-4-3)-(9CI) (CA INDEX NAME)

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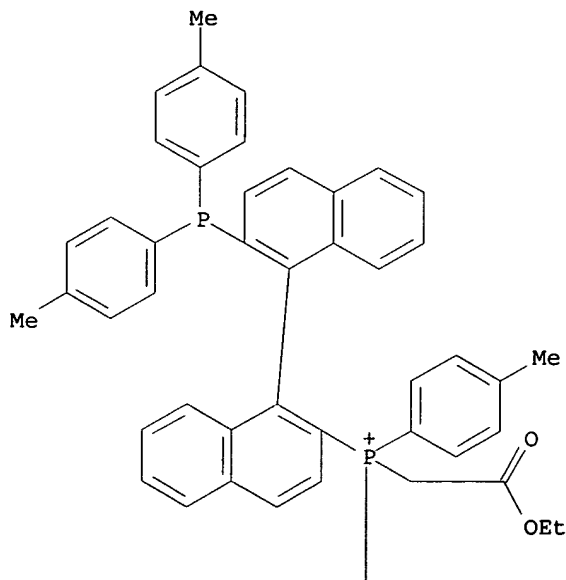
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 220135-21-7P 220135-24-0P 220135-25-1P  
 220135-27-3P 220135-28-4P

RL: RCT (Reactant); SPN (Synthetic preparation); **PREP**  
 (**Preparation**); RACT (Reactant or reagent)  
 (prepn. of novel chiral phosphorus ylides and their palladium,  
 rhodium and ruthenium complexes as catalysts for asym. induction)

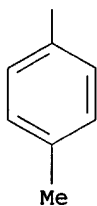
RN 220135-17-1 HCAPLUS

CN Phosphonium, [(1S)-2'-[bis(4-methylphenyl)phosphino][1,1'-  
 binaphthalen]-2-yl](2-ethoxy-2-oxoethyl)bis(4-methylphenyl)-,  
 bromide (9CI) (CA INDEX NAME)

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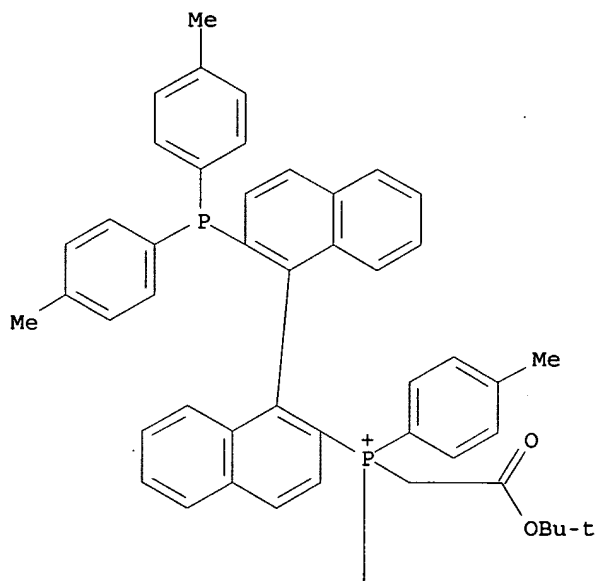


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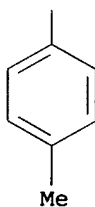


RN 220135-18-2 HCAPLUS  
CN Phosphonium, [(1S)-2'-[bis(4-methylphenyl)phosphino] [1,1'-binaphthalen]-2-yl] [2-(1,1-dimethylethoxy)-2-oxoethyl]bis(4-methylphenyl)-, bromide (9CI) (CA INDEX NAME)

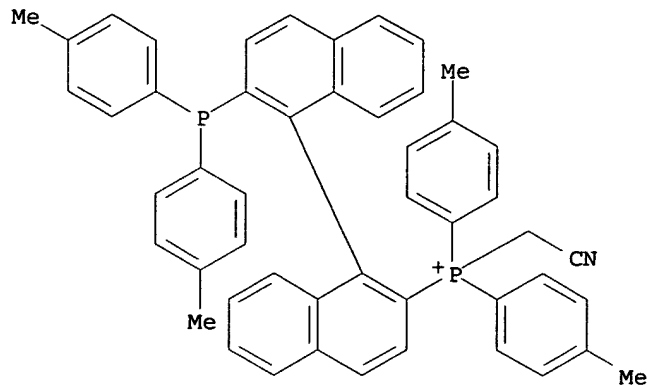
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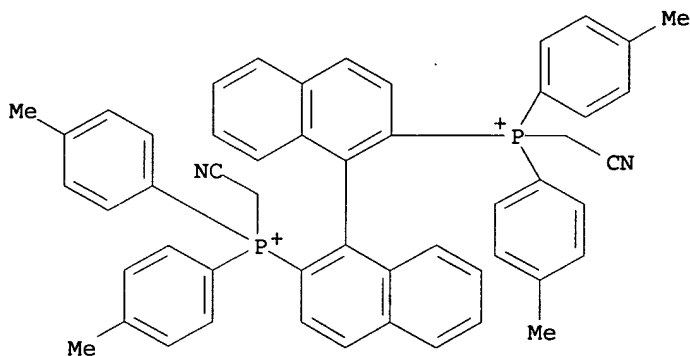


RN 220135-20-6 HCAPLUS  
 CN Phosphonium, [(1S)-2'-[bis(4-methylphenyl)phosphino] [1,1'-binaphthalen]-2-yl] (cyanomethyl)bis(4-methylphenyl)-, bromide (9CI)  
 (CA INDEX NAME)



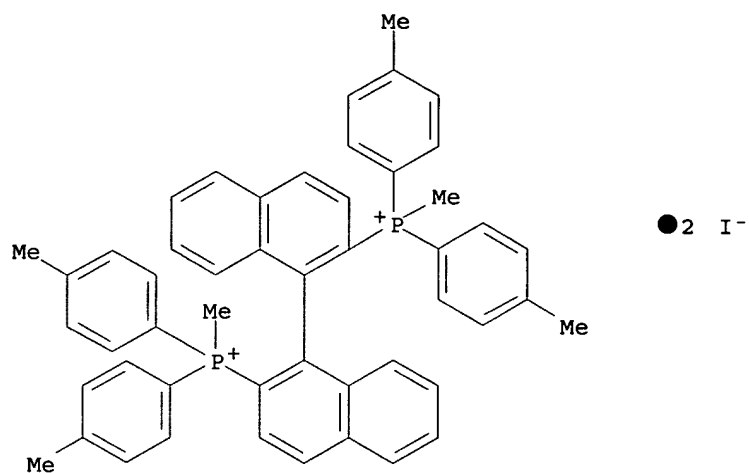
● Br<sup>-</sup>

RN 220135-21-7 HCAPLUS  
 CN Phosphonium, (1S)-[1,1'-binaphthalene]-2,2'-diylbis[(cyanomethyl)bis(4-methylphenyl)-, dibromide (9CI) (CA INDEX NAME)



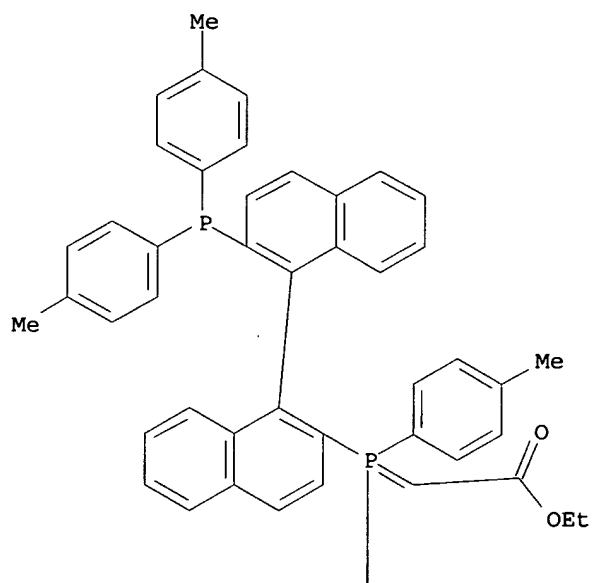
●2 Br<sup>-</sup>

RN 220135-24-0 HCAPLUS  
 CN Phosphonium, (1S)-[1,1'-binaphthalene]-2,2'-diylbis[methylbis(4-methylphenyl)-, diiodide (9CI) (CA INDEX NAME)

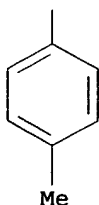


RN 220135-25-1 HCAPLUS  
 CN Acetic acid, [[(1S)-2'-[bis(4-methylphenyl)phosphino][1,1'-binaphthalen]-2-yl]bis(4-methylphenyl)phosphoranylidene]-, ethyl ester (9CI) (CA INDEX NAME)

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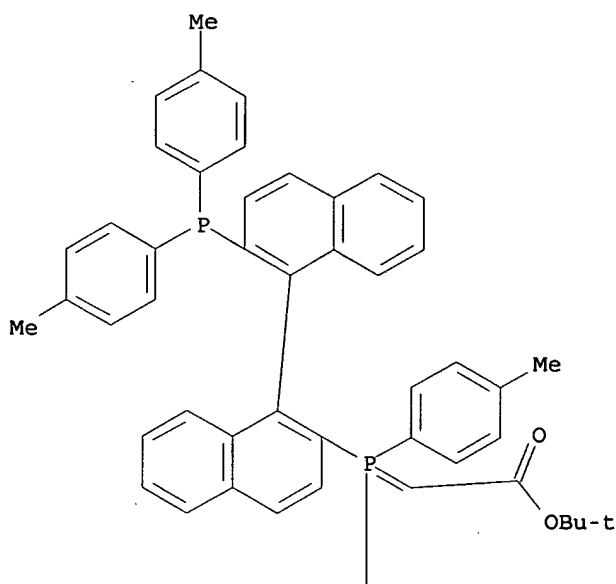


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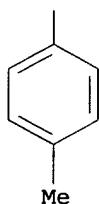


RN 220135-27-3 HCAPLUS  
CN Acetic acid, [[[1S]-2'-[bis(4-methylphenyl)phosphino][1,1'-binaphthalen]-2-yl]bis(4-methylphenyl)phosphoranylidene]-, 1,1-dimethylethyl ester (9CI) (CA INDEX NAME)

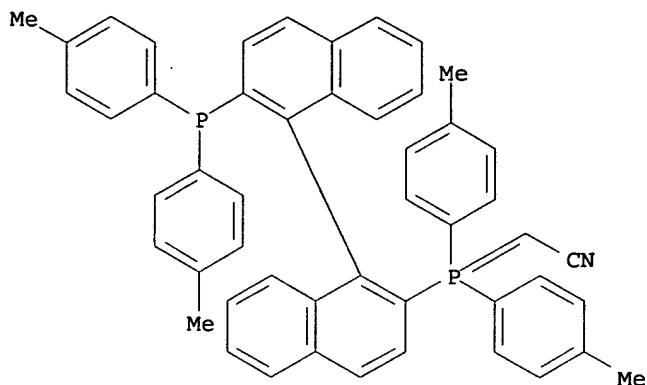
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RN 220135-28-4 HCAPLUS  
CN Acetonitrile, [[[1S]-2'-[bis(4-methylphenyl)phosphino][1,1'-binaphthalen]-2-yl]bis(4-methylphenyl)phosphoranylidene]- (9CI) (CA INDEX NAME)



IT 220119-59-5P 220119-61-9P 220119-65-3P

220119-66-4P 220119-67-5P

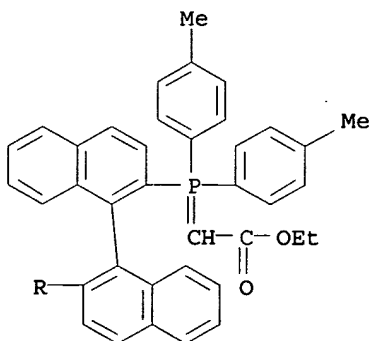
RL: SPN (Synthetic preparation); PREP (Preparation)

(prepn. of novel chiral phosphorus ylides and their palladium,  
rhodium and ruthenium complexes as catalysts for asym. induction)

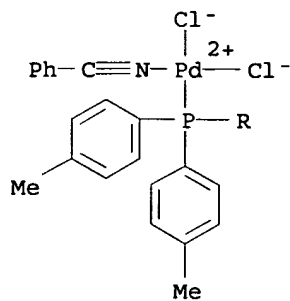
RN 220119-59-5 HCAPLUS

CN Palladium, (benzonitrile)dichloro[ethyl [[[(1S)-2'-[bis(4-methylphenyl)phosphino-κP] [1,1'-binaphthalen]-2-yl]bis(4-methylphenyl)phosphoranylidene]acetate]-, (SP-4-3)- (9CI) (CA INDEX NAME)

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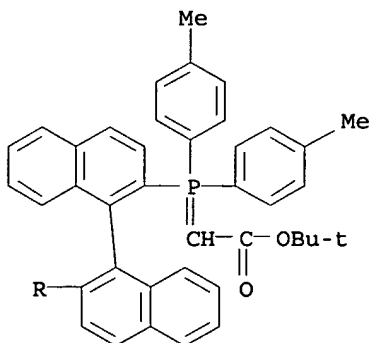


RN 220119-61-9 HCAPLUS

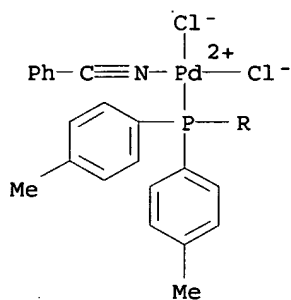


CN Palladium, (benzonitrile)dichloro[1,1-dimethylethyl  
 [[(1S)-2'-[bis(4-methylphenyl)phosphino-κP][1,1'-binaphthalen]-  
 2-yl]bis(4-methylphenyl)phosphoranylidene]acetate]-, (SP-4-3)- (9CI)  
 (CA INDEX NAME)

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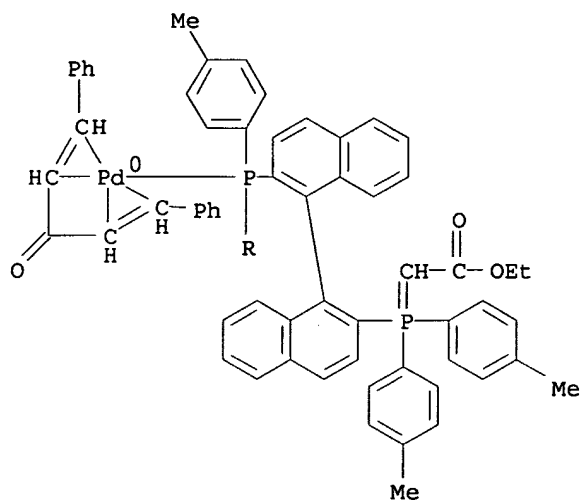
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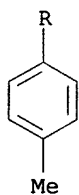
RN 220119-65-3 HCAPLUS

CN Palladium, [(1,2,4,5-η)-1,5-diphenyl-1,4-pentadien-3-one] [ethyl  
 [[(1S)-2'-[bis(4-methylphenyl)phosphino-κP][1,1'-binaphthalen]-  
 2-yl]bis(4-methylphenyl)phosphoranylidene]acetate]- (9CI) (CA INDEX  
 NAME)

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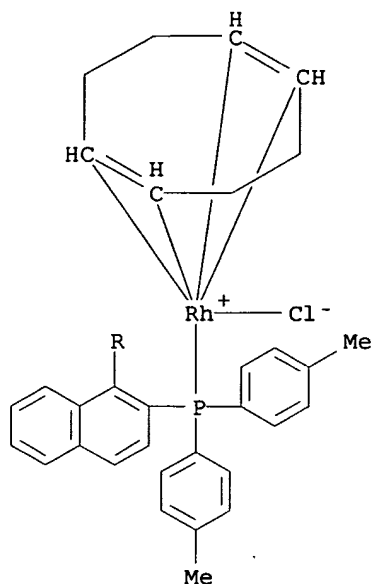


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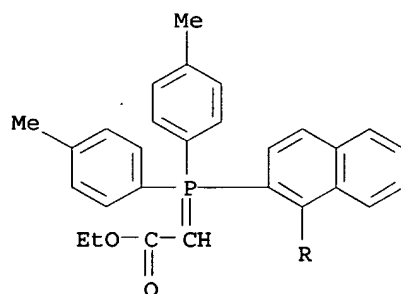


RN 220119-66-4 HCAPLUS  
 CN Rhodium, chloro[(1,2,5,6-η)-1,5-cyclooctadiene][ethyl  
 [[(1S)-2'-[bis(4-methylphenyl)phosphino-κP][1,1'-binaphthalen]-  
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 NAME)

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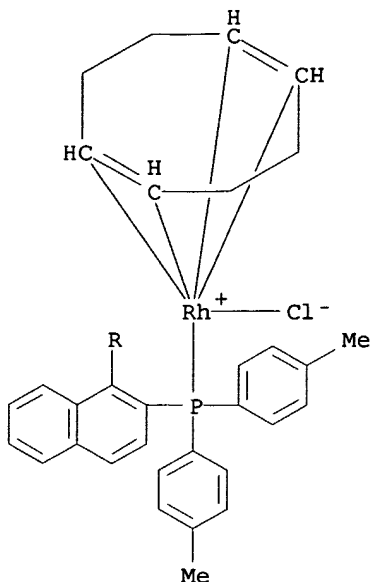


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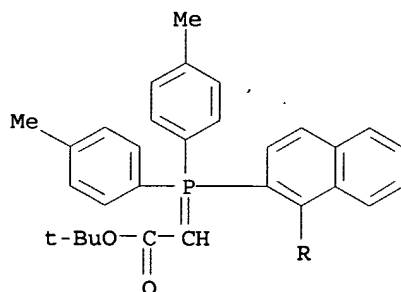


RN 220119-67-5 HCAPLUS  
 CN Rhodium, chloro[(1,2,5,6- $\eta$ )-1,5-cyclooctadiene] [1,1-dimethylethyl [[(1S)-2'-[bis(4-methylphenyl)phosphino- $\kappa$ P] [1,1'-binaphthalen]-2-yl]bis(4-methylphenyl)phosphoranylidene]acetate]-(9CI) (CA INDEX NAME)

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- CC 29-13 (Organometallic and Organometalloidal Compounds)  
Section cross-reference(s): 25, 67, 78
- IT Ylides  
RL: CAT (Catalyst use); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)  
(phosphorus; prepn. of novel chiral phosphorus ylides and their palladium, rhodium and ruthenium complexes as catalysts for asym. induction)
- IT Transition metal complexes  
RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
(prepn. of novel chiral phosphorus ylides and their palladium, rhodium and ruthenium complexes as catalysts for asym. induction)
- IT 220119-48-2P 220119-50-6P 220119-51-7P  
220119-52-8P 220119-53-9P 220119-55-1P  
220119-57-3P 220119-63-1P  
RL: CAT (Catalyst use); SPN (Synthetic preparation);  
PREP (Preparation); USES (Uses)  
(prepn. of novel chiral phosphorus ylides and their palladium, rhodium and ruthenium complexes as catalysts for asym. induction)

IT 220135-17-1P 220135-18-2P 220135-20-6P  
 220135-21-7P 220135-24-0P 220135-25-1P  
 220135-27-3P 220135-28-4P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP  
 (Preparation); RACT (Reactant or reagent)  
 (prepn. of novel chiral phosphorus ylides and their palladium,  
 rhodium and ruthenium complexes as catalysts for asym. induction)  
 IT 5787-28-0P, (S)-2-Phenylbutane 220119-59-5P  
 220119-61-9P 220119-65-3P 220119-66-4P  
 220119-67-5P  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (prepn. of novel chiral phosphorus ylides and their palladium,  
 rhodium and ruthenium complexes as catalysts for asym. induction)

L26 ANSWER 49 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1998:466349 HCAPLUS

DOCUMENT NUMBER: 129:124055

TITLE: Preparation of chiral  
 (5,6),(5',6')-bis(3,4-methylenedioxy)biphenyl-  
 2,2'-diylphosphine compound,  
 intermediate for preparing the same,  
 transition metal complex  
 having the same diphosphine compound  
 as ligand and asymmetric hydrogenation  
 catalyst

INVENTOR(S): Saito, Takao; Yokozawa, Tohru; Xiaoyaong, Zhang;  
 Sayo, Noboru

PATENT ASSIGNEE(S): Takasago International Corp., Japan

SOURCE: Eur. Pat. Appl., 17 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

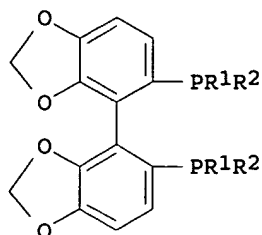
LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 850945	A1	19980701	EP 1997-403152	199712 24
EP 850945	B1	20021127		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
JP 10182678	A2	19980707	JP 1996-359818	199612 26
JP 3148136	B2	20010319		
US 5872273	A	19990216	US 1997-996405	199712 22
PRIORITY APPLN. INFO.:			JP 1996-359818	A 199612 26

OTHER SOURCE(S): MARPAT 129:124055  
 GI



I

AB The present invention provides a novel diphosphine compd. of the formula (I; R1 and R2 represent independently cycloalkyl, unsubstituted or substituted Ph, or five-membered heteroarom. ring residue). The compd. is useful as a ligand having the excellent performance (diastereoselectivity, enantioselectivity, and catalytic activity) for an asym. reaction, in particular, asym. hydrogenation catalyst. Thus, diphenyl[2-iodo-(3,4)-methylenedioxyphenyl]phosphine (prepn. given) was coupled to each other in the presence of Cu powder in DMF at 140° for 8 h to give (±)-[(5,6)(5',6')-bis(methylenedioxy)biphenyl-2,2'-diyl]bis(diphenylphosphine oxide) [(±)-II]. Optical resolu. of the latter compd. by cyclocondensation with (-)-dibenzoyl-L-tartaric acid in EtOAc at 60° for 30 min followed by alkali hydrolysis gave (-)-II, which was reduced by SiCl4 in the presence of dimethylaniline in toluene at 100° for 4 h to give (-)-I (R1 = R2 = Ph) [(-)-SEGPHOS]. [Ru(COD)Cl2]2, (-)-SEGPHOS, Et3N, and toluene was refluxed for 15 h under N followed distg. off the solvent and vacuum drying to give the catalyst Ru2Cl4[(-)-SEGPHOS]2NEt3. The latter catalyst, 2-oxo-1-propanol, and MeOH was autoclaved with stirring at H pressure 10 atm and 65° for 16 to give optically active 1,2-propanediol of 97.4%ee in 99.8%.

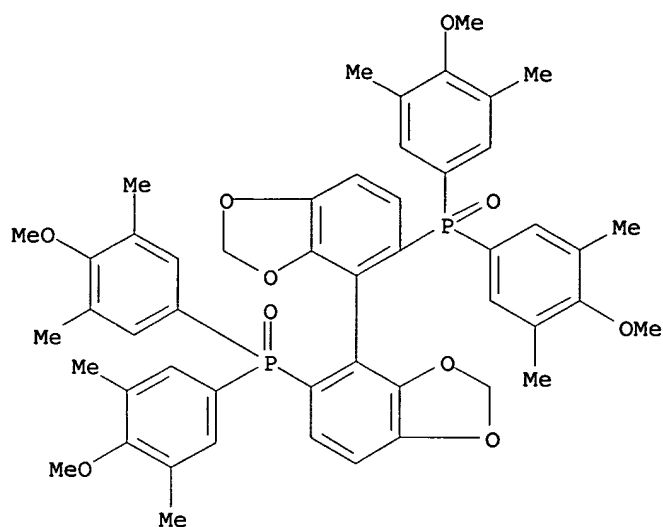
IT 210169-37-2P 210169-38-3P 210169-39-4P  
210169-40-7P 210169-41-8P 210169-42-9P  
210169-43-0P 210169-44-1P 210169-45-2P  
210169-46-3P 210169-47-4P 210169-48-5P  
210169-49-6P 210169-50-9P 210169-51-0P  
210169-52-1P

RL: CAT (Catalyst use); PUR (Purification or recovery);  
SPN (Synthetic preparation); PREP (Preparation); USES  
(Uses)

(prepn. of chiral bis(methylenedioxy)  
biphenyldiylphosphine and their transition  
metal complexes as ligands and asym.  
hydrogenation catalysts)

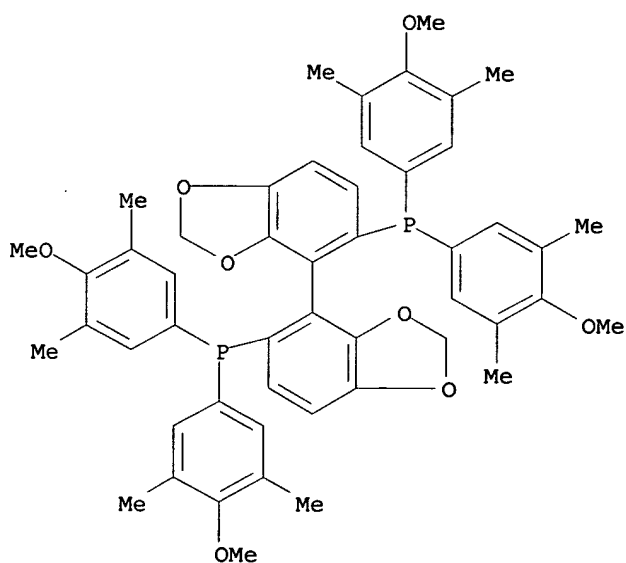
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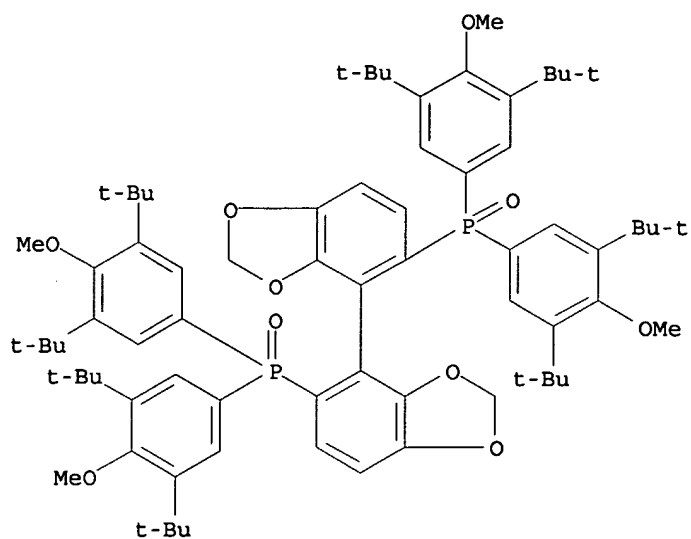
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CN Phosphine, [(4S)-[4,4'-bi-1,3-benzodioxole]-5,5'-diyl]bis[bis(4-methoxy-3,5-dimethylphenyl)]- (9CI) (CA INDEX NAME)



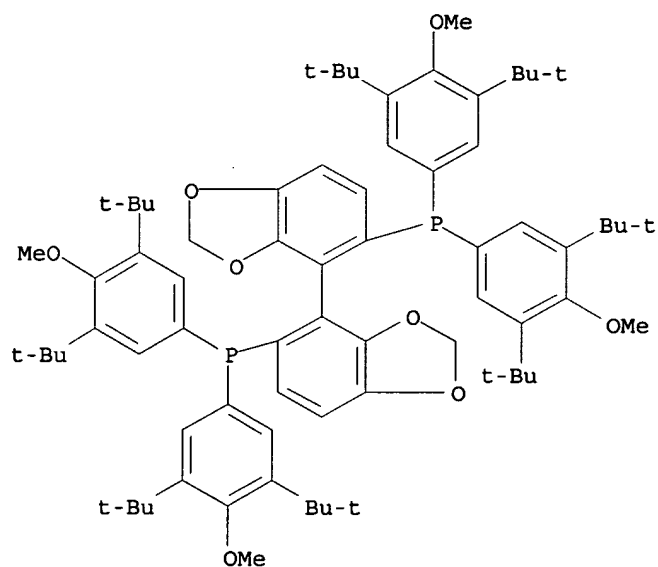
RN 210169-39-4 HCAPLUS

CN Phosphine oxide, [4,4'-bi-1,3-benzodioxole]-5,5'-diylbis[bis(3,5-bis(1,1-dimethylethyl)-4-methoxyphenyl)]-, (+)- (9CI) (CA INDEX NAME)



RN 210169-40-7 HCAPLUS

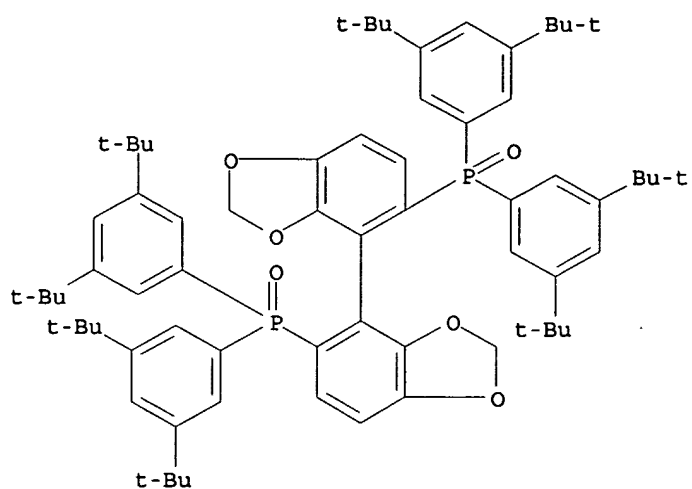
CN Phosphine, [(4S)-[4,4'-bi-1,3-benzodioxole]-5,5'-diyl]bis[bis[3,5-bis(1,1-dimethylethyl)-4-methoxyphenyl]-(9CI) (CA INDEX NAME)



RN 210169-41-8 HCAPLUS

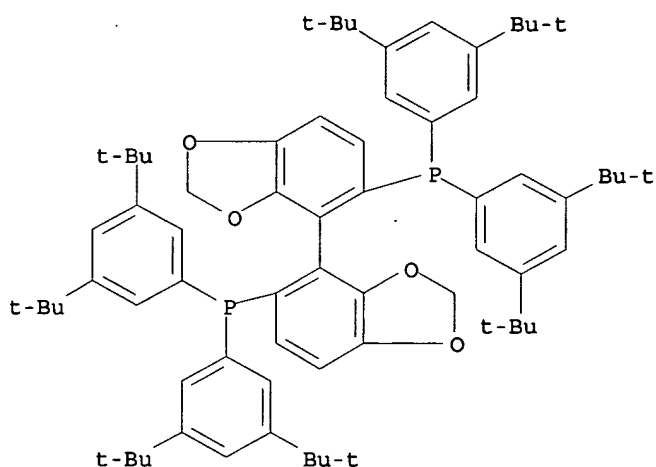
CN Phosphine oxide, [(4S)-[4,4'-bi-1,3-benzodioxole]-5,5'-diyl]bis[bis[3,5-bis(1,1-dimethylethyl)phenyl]-(9CI) (CA INDEX NAME)





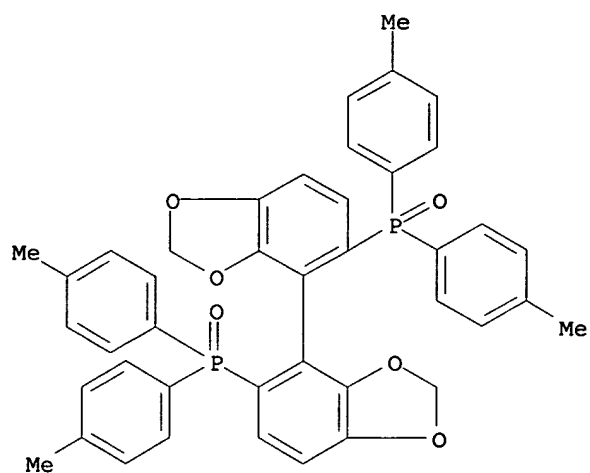
RN 210169-42-9 HCAPLUS

CN Phosphine, [4,4'-bi-1,3-benzodioxole]-5,5'-diylbis[bis(3,5-bis(1,1-dimethylethyl)phenyl)-, (+)- (9CI) (CA INDEX NAME)



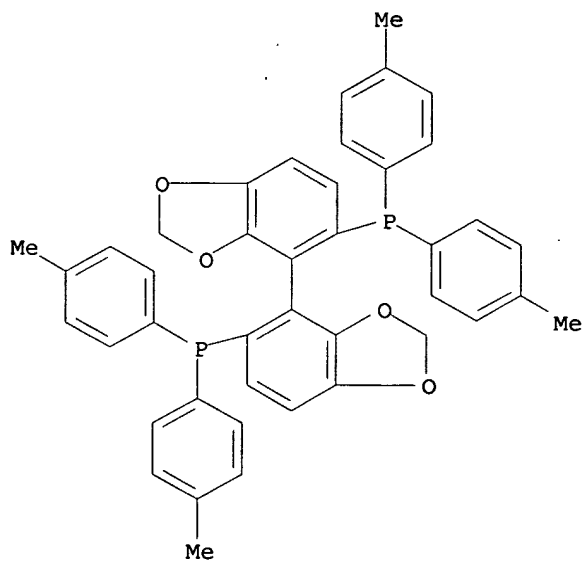
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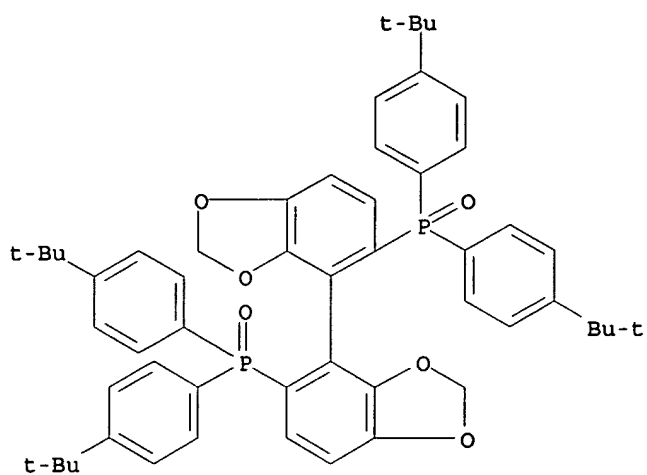
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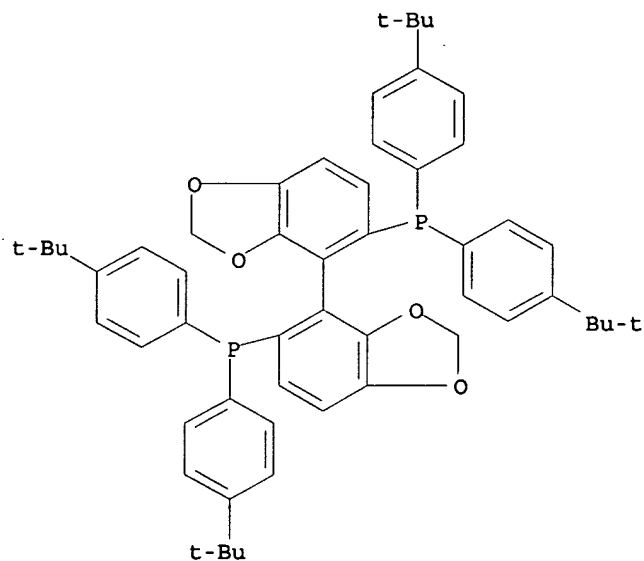
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CN Phosphine oxide, [4,4'-bi-1,3-benzodioxole]-5,5'-diylbis[bis(4-(1,1-dimethylethyl)phenyl)-, (+)- (9CI) (CA INDEX NAME)]



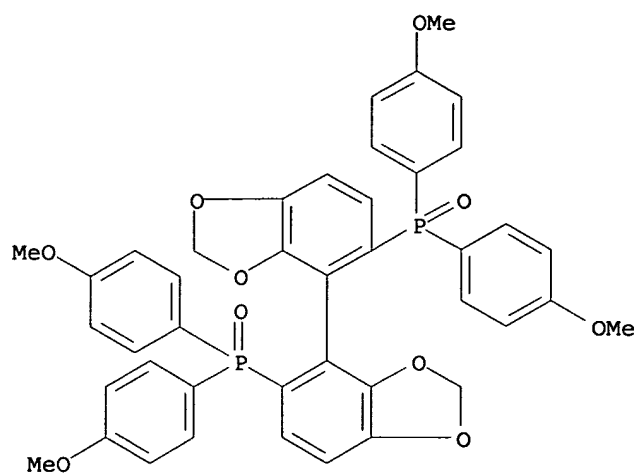
RN 210169-46-3 HCAPLUS

CN Phosphine, [4,4'-bi-1,3-benzodioxole]-5,5'-diylbis[bis(4-(1,1-dimethylethyl)phenyl)-, (+)- (9CI) (CA INDEX NAME)

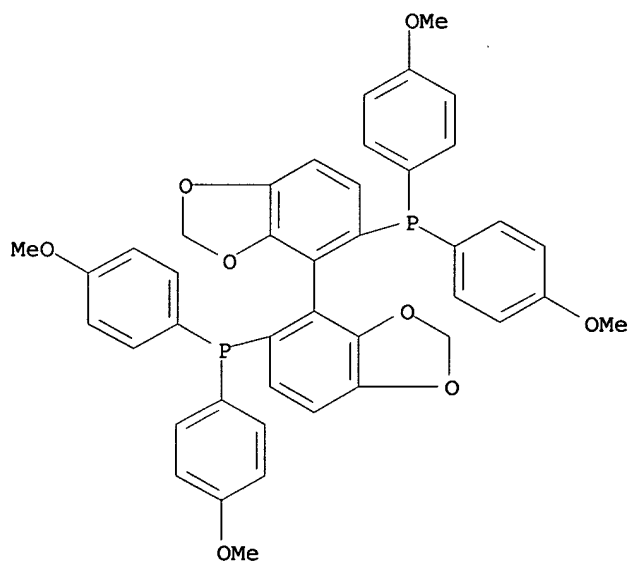


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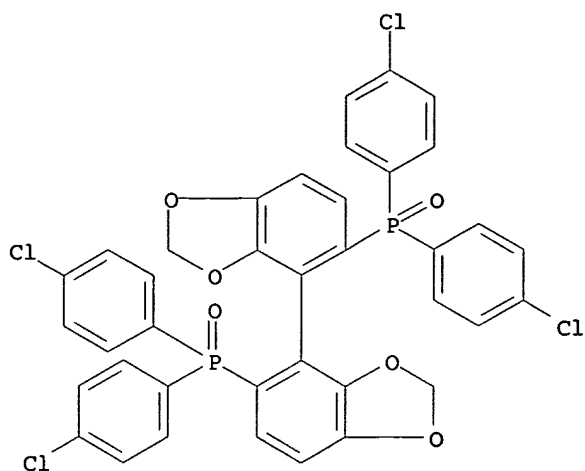
CN Phosphine oxide, [4,4'-bi-1,3-benzodioxole]-5,5'-diylbis[bis(4-methoxyphenyl)-, (+)- (9CI) (CA INDEX NAME)



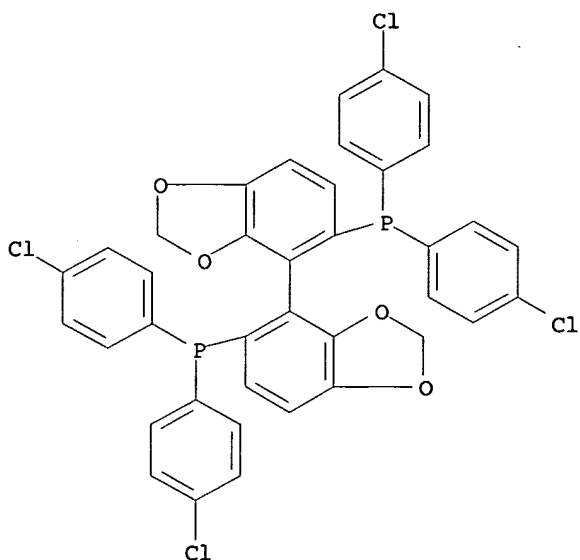
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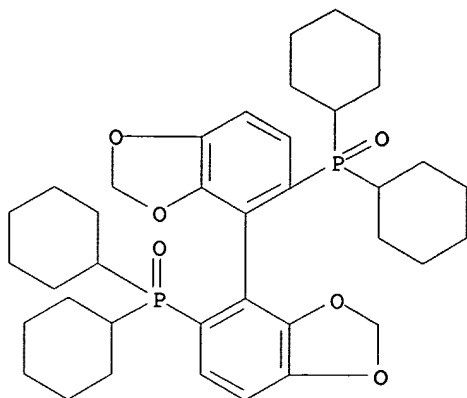
RN 210169-49-6 HCAPLUS  
 CN Phosphine oxide, [4,4'-bi-1,3-benzodioxole]-5,5'-diylbis[bis(4-chlorophenyl)]-, (+)- (9CI) (CA INDEX NAME)



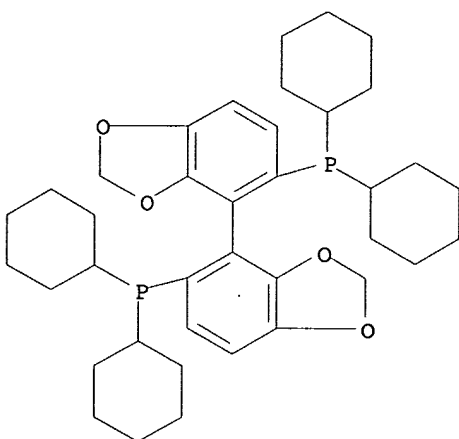
RN 210169-50-9 HCAPLUS  
 CN Phosphine, [4,4'-bi-1,3-benzodioxole]-5,5'-diylbis[bis(4-chlorophenyl)-, (+)- (9CI) (CA INDEX NAME)]



RN 210169-51-0 HCAPLUS  
 CN Phosphine oxide, [(4S)-[4,4'-bi-1,3-benzodioxole]-5,5'-diyl]bis[dicyclohexyl- (9CI) (CA INDEX NAME)]

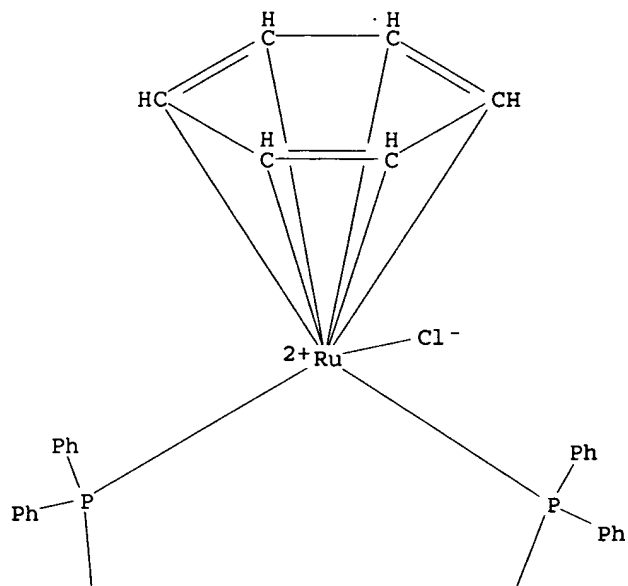


RN 210169-52-1 HCAPLUS  
 CN Phosphine, [4,4'-bi-1,3-benzodioxole]-5,5'-diylbis[dicyclohexyl-,  
 (+)- (9CI) (CA INDEX NAME)

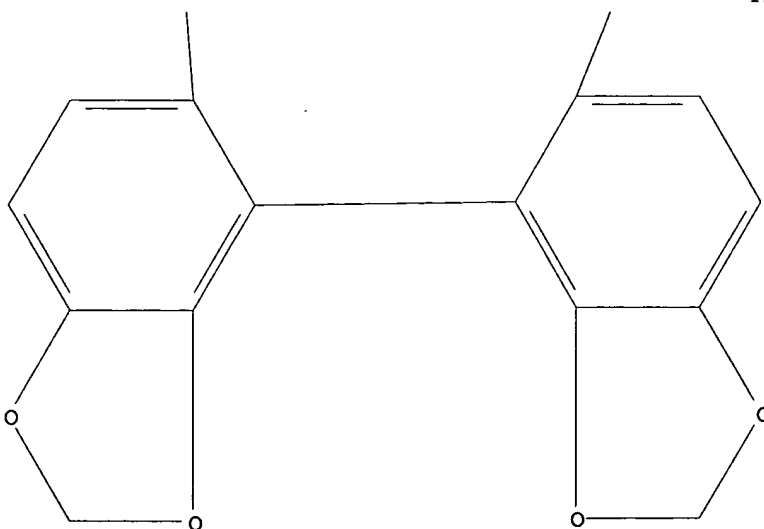


IT 210174-68-8P 210174-69-9P 210174-71-3P  
 210174-72-4P  
 RL: CAT (Catalyst use); SPN (Synthetic preparation);  
 PREP (Preparation); USES (Uses)  
 (prepn. of chiral bis(methylenedioxy)  
 biphenyldiylphosphine and their transition  
 metal complexes as ligands and asym.  
 hydrogenation catalysts)  
 RN 210174-68-8 HCAPLUS  
 CN Ruthenium(1+), (η<sup>6</sup>-benzene)[(4S)-4,4'-bi-1,3-benzodioxole-5,5'-  
 diylbis[diphenylphosphine-κP]]chloro-, chloride (9CI) (CA  
 INDEX NAME)

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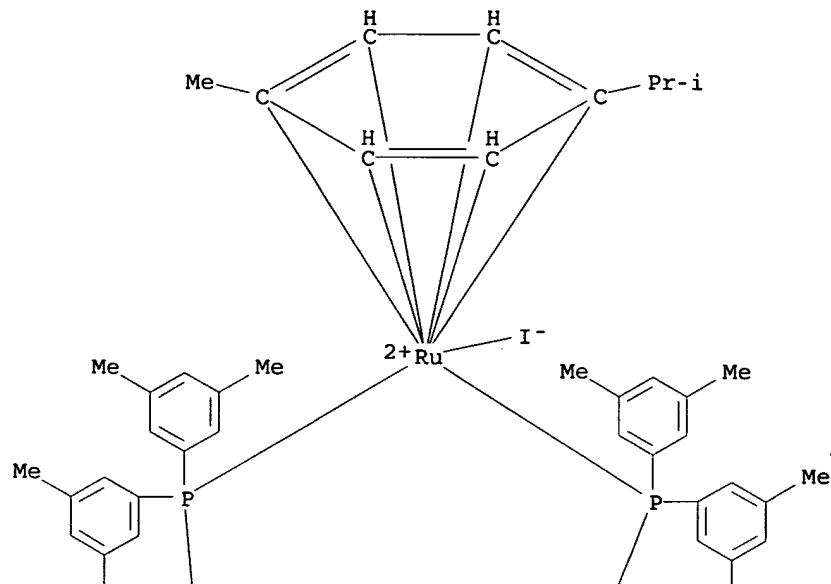


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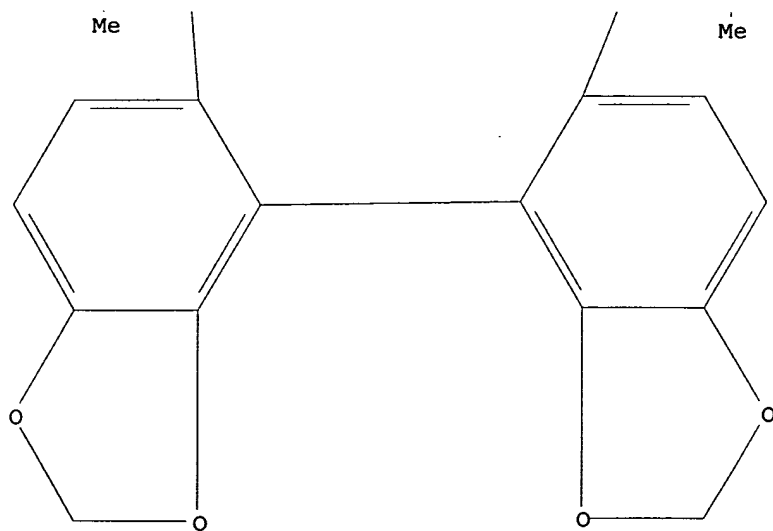


RN 210174-69-9 HCAPLUS  
 CN Ruthenium(1+), [(4S)-[4,4'-bi-1,3-benzodioxole]-5,5'-diylbis[bis(3,5-dimethylphenyl)phosphine-κP]]iodo[(1,2,3,4,5,6-η)-1-methyl-4-(1-methylethyl)benzene]-, iodide (9CI) (CA INDEX NAME)

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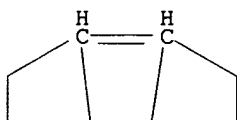
RN 210174-71-3 HCAPLUS  
 CN Rhodium(1+), [(4S)-[4,4'-bi-1,3-benzodioxole]-5,5'-diylbis[bis(3,5-dimethylphenyl)phosphine-κP]] [(1,2,5,6-η)-1,5-cyclooctadiene]-, perchlorate (9CI) (CA INDEX NAME)

CM 1

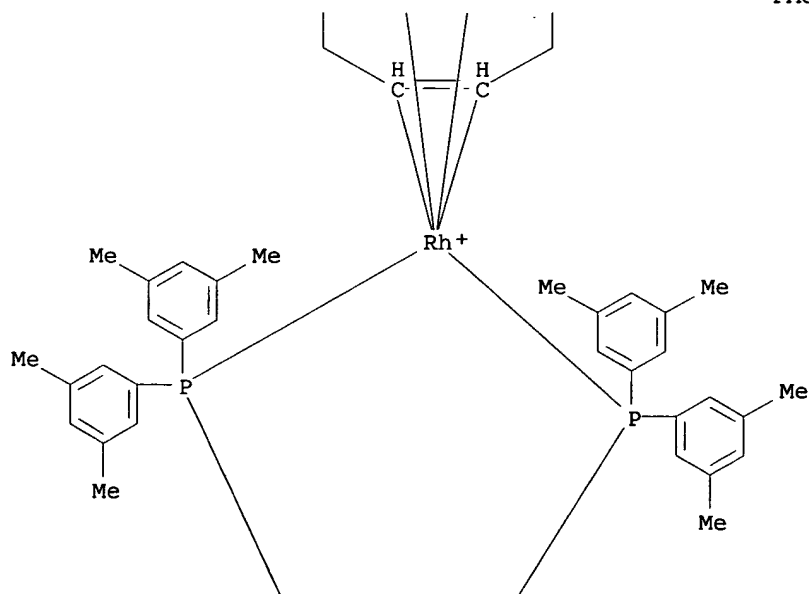


CRN 210174-70-2  
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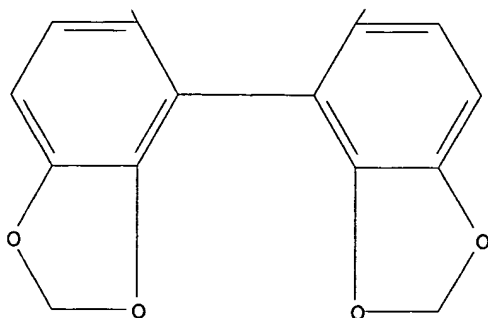
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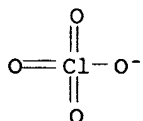
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CM 2

CRN 14797-73-0

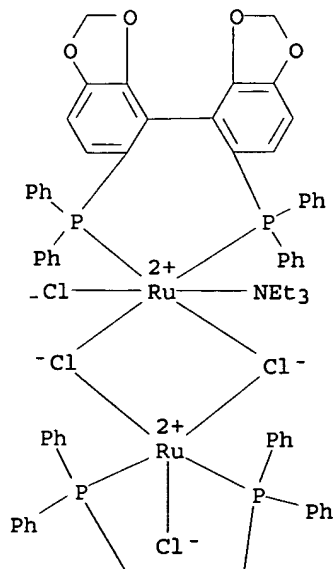
CMF Cl O4



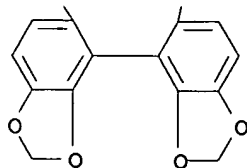
RN 210174-72-4 HCAPLUS

CN Ruthenium, bis[(4S)-[4,4'-bi-1,3-benzodioxole]-5,5'-  
diylbis[diphenylphosphine-κP]]di-μ-chlorodichloro(N,N-  
diethylethanamine)di-, stereoisomer (9CI) (CA INDEX NAME)

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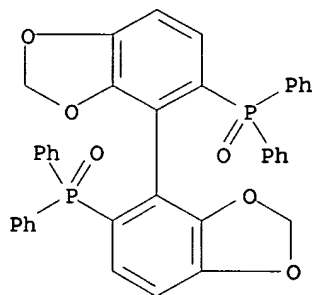
IT 210169-53-2P 210169-55-4P

RL: PUR (Purification or recovery); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(prepn. of chiral bis(methylenedioxy)  
biphenyldiylphosphine and their transition  
metal complexes as ligands and asym.  
hydrogenation catalysts)

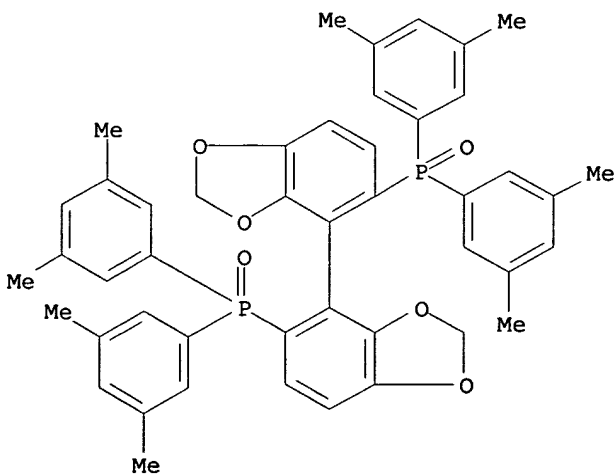
RN 210169-53-2 HCAPLUS

CN Phosphine oxide, [(4S)-[4,4'-bi-1,3-benzodioxole]-5,5'-diyl]bis[diphenyl- (9CI) (CA INDEX NAME)]



RN 210169-55-4 HCAPLUS

CN Phosphine oxide, [(4S)-[4,4'-bi-1,3-benzodioxole]-5,5'-diyl]bis[bis(3,5-dimethylphenyl)- (9CI) (CA INDEX NAME)]

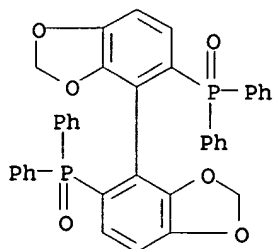


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209981-76-0P 209981-77-1P 209981-78-2P  
209981-79-3P 210169-54-3P 210169-57-6P

RL: RCT (Reactant); SPN (Synthetic preparation); **PREP**  
**(Preparation)**; RACT (Reactant or reagent)  
 (prepn. of chiral bis(methylenedioxy)  
 biphenyldiylphosphine and their transition  
 metal complexes as ligands and asym.  
 hydrogenation catalysts)

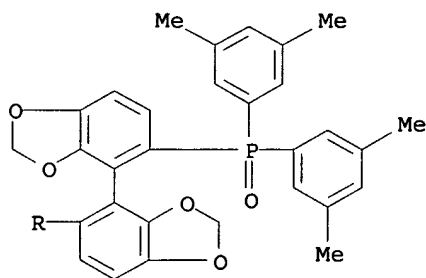
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 (9CI) (CA INDEX NAME)



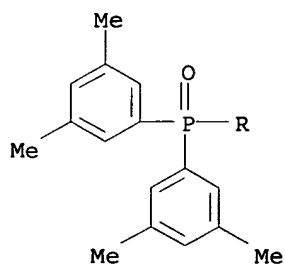
RN 209981-71-5 HCAPLUS

CN Phosphine oxide, [4,4'-bi-1,3-benzodioxole]-5,5'-diylbis[bis(3,5-  
 dimethylphenyl)- (9CI) (CA INDEX NAME)



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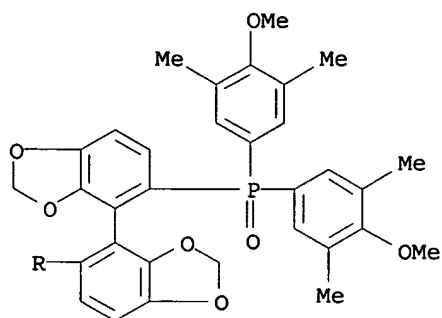
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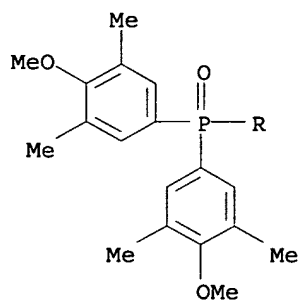
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CN Phosphine oxide, [4,4'-bi-1,3-benzodioxole]-5,5'-diylbis[bis(4-  
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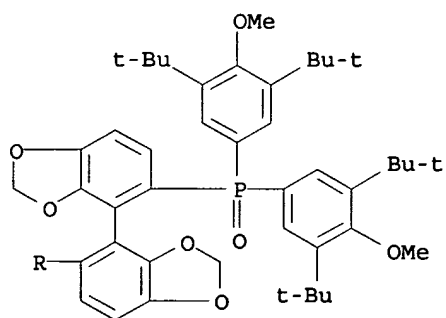


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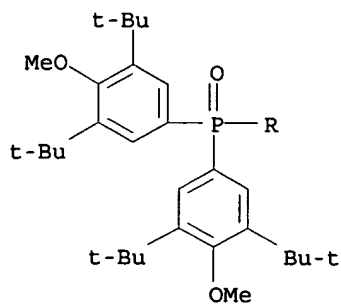


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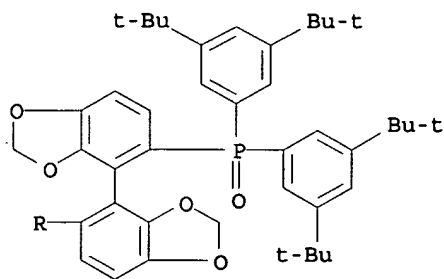


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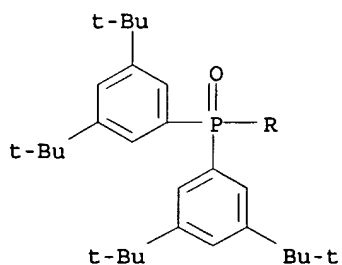


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 CN Phosphine oxide, [4,4'-bi-1,3-benzodioxole]-5,5'-diylbis[bis(3,5-bis(1,1-dimethylethyl)phenyl)- (9CI) (CA INDEX NAME)]

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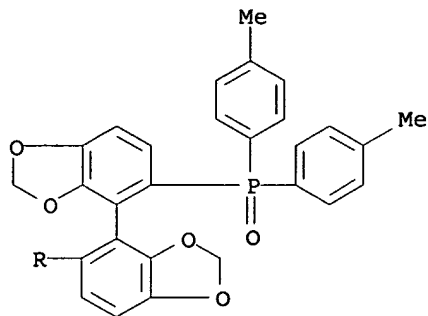


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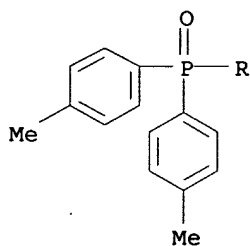


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 CN Phosphine oxide, [4,4'-bi-1,3-benzodioxole]-5,5'-diylbis[bis(4-methylphenyl)- (9CI) (CA INDEX NAME)]

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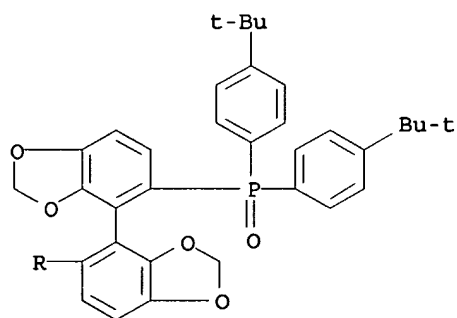


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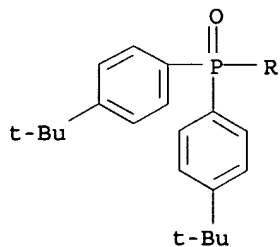


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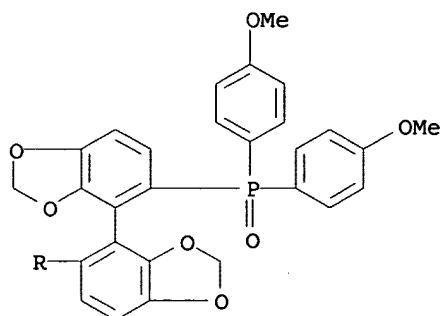


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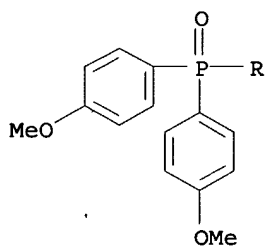


RN 209981-77-1 HCAPLUS  
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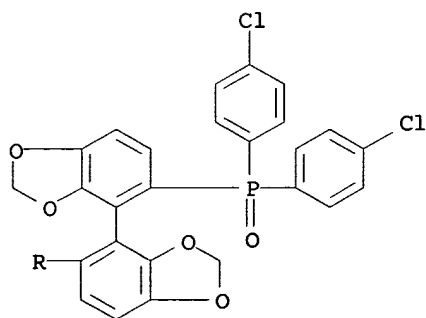


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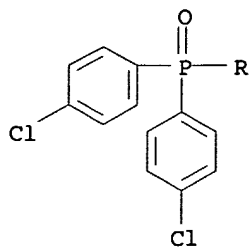
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PAGE 1-A

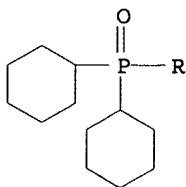
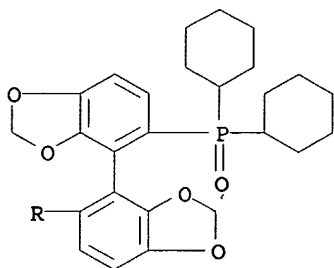




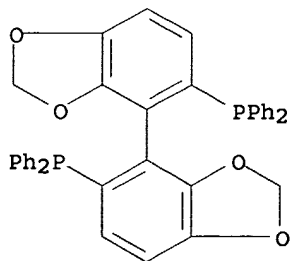
PAGE 2-A



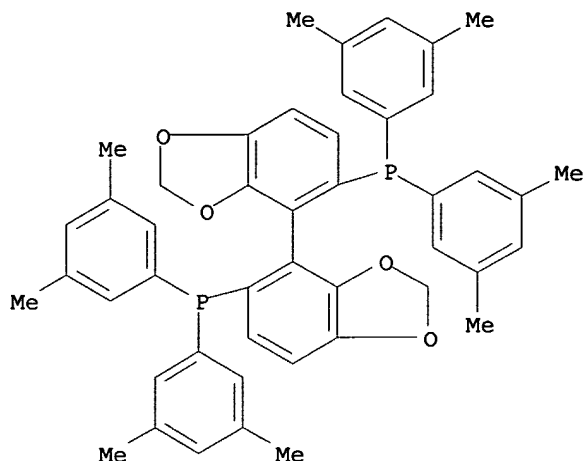
RN 209981-79-3 HCAPLUS  
 CN Phosphine oxide, [4,4'-bi-1,3-benzodioxole]-5,5'-  
 diylbis[dicyclohexyl- (9CI) (CA INDEX NAME)]



RN 210169-54-3 HCAPLUS  
 CN Phosphine, (4S)-[4,4'-bi-1,3-benzodioxole]-5,5'-diylbis[diphenyl-  
 (9CI) (CA INDEX NAME)]



RN 210169-57-6 HCAPLUS  
 CN Phosphine, (4S)-[4,4'-bi-1,3-benzodioxole]-5,5'-diylbis[bis(3,5-  
 dimethylphenyl)- (9CI) (CA INDEX NAME)]



- IC ICM C07F009-655  
ICS C07F015-00; B01J031-28
- ICA C07M007-00
- CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)  
Section cross-reference(s): 29, 67, 78
- ST **methylenedioxybiphenyldiphenylphosphine prepn**  
**ligand asym hydrogenation catalyst; phenylphosphine**  
methylenedioxy biphenyl asym hydrogenation catalyst; ruthenium  
**phosphine complex catalyst; rhodium phosphine**  
complex catalyst; ketone asym hydrogenation; **transition**  
**metal biphenylylphosphine complex**
- IT Asymmetric **synthesis** and induction  
(**prepn.** of chiral bis(methylenedioxy)  
**biphenyldiylphosphine** and their **transition**  
**metal complexes as ligands** and asym.  
hydrogenation catalysts)
- IT **Transition metal complexes**  
RL: CAT (Catalyst use); USES (Uses)  
(**prepn.** of chiral bis(methylenedioxy)  
**biphenyldiylphosphine** and their **transition**  
**metal complexes as ligands** and asym.  
hydrogenation catalysts)
- IT Alcohols, **preparation**  
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP  
(Preparation)  
(**prepn.** of chiral bis(methylenedioxy)  
**biphenyldiylphosphine** and their **transition**  
**metal complexes as ligands** and asym.  
hydrogenation catalysts)
- IT Ketones, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(**prepn.** of chiral bis(methylenedioxy)  
**biphenyldiylphosphine** and their **transition**  
**metal complexes as ligands** and asym.  
hydrogenation catalysts)
- IT Hydrogenation  
Hydrogenation catalysts  
(stereoselective; **prepn.** of chiral bis(methylenedioxy)  
**biphenyldiylphosphine** and their **transition**  
**metal complexes as ligands** and asym.  
hydrogenation catalysts)
- IT 210169-37-2P 210169-38-3P 210169-39-4P  
210169-40-7P 210169-41-8P 210169-42-9P  
210169-43-0P 210169-44-1P 210169-45-2P  
210169-46-3P 210169-47-4P 210169-48-5P

210169-49-6P 210169-50-9P 210169-51-0P

210169-52-1P

RL: CAT (Catalyst use); PUR (Purification or recovery);

SPN (Synthetic preparation); PREP (Preparation); USES

(Uses)

(prepn. of chiral bis(methylenedioxy)  
biphenyldiylphosphine and their transition  
metal complexes as ligands and asym.  
hydrogenation catalysts)

IT 210174-68-8P 210174-69-9P 210174-71-3P

210174-72-4P

RL: CAT (Catalyst use); SPN (Synthetic preparation);

PREP (Preparation); USES (Uses)

(prepn. of chiral bis(methylenedioxy)  
biphenyldiylphosphine and their transition  
metal complexes as ligands and asym.  
hydrogenation catalysts)

IT 210169-53-2P 210169-55-4P

RL: PUR (Purification or recovery); RCT (Reactant); SPN (Synthetic  
preparation); PREP (Preparation); RACT (Reactant or  
reagent)

(prepn. of chiral bis(methylenedioxy)  
biphenyldiylphosphine and their transition  
metal complexes as ligands and asym.  
hydrogenation catalysts)

IT 116-09-6 1499-21-4, Diphenylphosphinyl chloride 2635-13-4,  
4-Bromo-1,2-methylenedioxybenzene 2743-38-6, Dibenzoyl-L-tartaric  
acid 20445-33-4 59420-05-2 90614-07-6 129994-60-1  
137219-83-1

RL: RCT (Reactant); RACT (Reactant or reagent)

(prepn. of chiral bis(methylenedioxy)  
biphenyldiylphosphine and their transition  
metal complexes as ligands and asym.  
hydrogenation catalysts)

IT 209981-66-8P 209981-67-9P 209981-68-0P 209981-69-1P

209981-70-4P 209981-71-5P 209981-72-6P

209981-73-7P 209981-74-8P 209981-75-9P

209981-76-0P 209981-77-1P 209981-78-2P

209981-79-3P 210169-54-3P 210169-57-6P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP

(Preparation); RACT (Reactant or reagent)

(prepn. of chiral bis(methylenedioxy)  
biphenyldiylphosphine and their transition  
metal complexes as ligands and asym.  
hydrogenation catalysts)

IT 57-55-6P, 1,2-Propanediol, preparation 142248-11-1P

RL: SPN (Synthetic preparation); PREP (Preparation)

(prepn. of chiral bis(methylenedioxy)  
biphenyldiylphosphine and their transition  
metal complexes as ligands and asym.  
hydrogenation catalysts)

REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR  
THIS RECORD. ALL CITATIONS AVAILABLE IN  
THE RE FORMAT

L26 ANSWER 50 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1998:304138 HCAPLUS

DOCUMENT NUMBER: 129:16234

TITLE: Preparation of optically active binaphthyl and  
octahydrobinaphthyl bis(phosphine) ligands

INVENTOR(S): Zhang, Xiaoyaong; Sayo, Noboru

PATENT ASSIGNEE(S): Takasago International Corp., Japan

SOURCE: Eur. Pat. Appl., 17 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

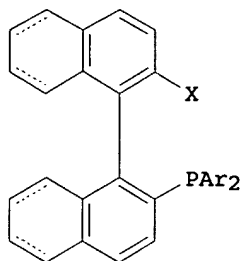
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 839819	A1	19980506	EP 1997-402528	19971024
EP 839819	B1	20030917		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
JP 10120692	A2	19980512	JP 1996-282157	19961024
JP 3445451	B2	20030908		
US 5922918	A	19990713	US 1997-957020	19971024

PRIORITY APPLN. INFO.:

JP 1996-282157 A  
19961024

OTHER SOURCE(S):  
GI

CASREACT 129:16234; MARPAT 129:16234



AB Compd. I (X = PAR<sub>2</sub>), ligand of a catalyst complex useful for asym. syntheses, was prepd. in an economical way by reacting compd. I (X = OTf) with phosphine oxides Ar<sub>2</sub>P(O)H in the presence of a transition metal/phosphine complex. In I, the double line consisting of a continuous line and a dotted line signifies either a double bond or a single bond, resp. forming part of a naphthalene ring or an octahydronaphthalene ring depending on whether the naphthalene ring was subjected to the redn. or not; Tf represents a trifluoromethanesulfonyl group; and Ar represents a Ph group, a substituted Ph group (bearing 1 to 3 substituents which may be the same or different and are selected from the group consisting of halogen atoms, lower alkyl group, lower alkoxy group and halogenated lower alkyl group) or a naphthyl group which may bear a lower alkyl or lower alkoxy substituent. For example, (S)-2,2'-bis(trifluoromethanesulfonyloxy)-1,1'-binaphthyl was reacted with bis(2-naphthyl)phosphine oxide in the presence of Pd(OAc)<sub>2</sub>, Ph<sub>2</sub>P(CH<sub>2</sub>)<sub>3</sub>PPh<sub>2</sub>, NaO<sub>2</sub>CH and iPr<sub>2</sub>EtN in DMSO to give 75% (S)-2-bis(2-naphthyl)phosphinyl-2'-(trifluoromethanesulfonyloxy)-1,1'-binaphthyl (1). 1 Was reduced to the phosphino analog (2) using Cl<sub>3</sub>SiH and dimethylaniline in toluene in 84% yield. 2 Was substituted with bis(2-naphthyl)phosphine oxide in DMF in the presence of Ni(dppe)Cl<sub>2</sub> and DABCO to give 56%

(S)-2-bis(2-naphthyl)phosphino-2'-bis(2-naphthyl)phosphinyl-1,1'-binaphthyl (3). 3 Was reduced similarly to 1 to give (S)-2,2'-bis(bis(2-naphthyl)phosphino)-1,1'-binaphthyl in 87% yield.

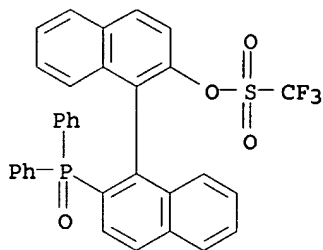
IT 132532-04-8P, (R)-2-Diphenylphosphinyl-2'-trifluoromethanesulfonyloxy-1,1'-binaphthyl 152646-80-5P, (R)-2-Diphenylphosphino-2'-diphenylphosphinyl-1,1'-binaphthyl 159496-90-9P, (R)-2-Diphenylphosphinyl-2'-trifluoromethanesulfonyloxy-5,5',6,6',7,7',8,8'-octahydro-1,1'-binaphthyl 187741-54-4P, (S)-2-(Bis(2-naphthyl)phosphinyl)-2'-trifluoromethanesulfonyloxy-1,1'-binaphthyl 187742-38-7P, (S)-2-(Bis(2-naphthyl)phosphino)-2'-trifluoromethanesulfonyloxy-1,1'-binaphthyl 187742-81-0P, (R)-2-Diphenylphosphino-2'-trifluoromethanesulfonyloxy-1,1'-binaphthyl 190896-71-0P, (S)-2-(Bis(2-naphthyl)phosphino)-2'-(bis(2-naphthyl)phosphinyl)-1,1'-binaphthyl 207683-39-4P, (R)-2-Diphenylphosphino-2'-trifluoromethanesulfonyloxy-5,5',6,6',7,7',8,8'-octahydro-1,1'-binaphthyl 207683-40-7P, (R)-2-Diphenylphosphino-2'-diphenylphosphinyl-5,5',6,6',7,7',8,8'-octahydro-1,1'-binaphthyl

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(intermediate for prepn. of optically active bis(phosphine))

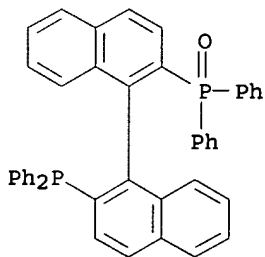
RN 132532-04-8 HCAPLUS

CN Methanesulfonic acid, trifluoro-, (1R)-2'-(diphenylphosphinyl)[1,1'-binaphthalen]-2-yl ester (9CI) (CA INDEX NAME)



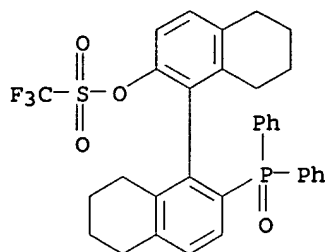
RN 152646-80-5 HCAPLUS

CN Phosphine oxide, [(1R)-2'-(diphenylphosphino)[1,1'-binaphthalen]-2-yl]diphenyl- (9CI) (CA INDEX NAME)



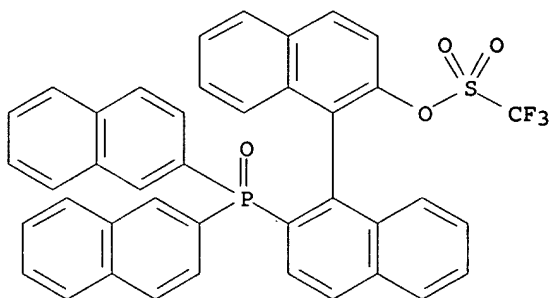
RN 159496-90-9 HCAPLUS

CN Methanesulfonic acid, trifluoro-, (1R)-2'-(diphenylphosphinyl)-5,5',6,6',7,7',8,8'-octahydro[1,1'-binaphthalen]-2-yl ester (9CI) (CA INDEX NAME)



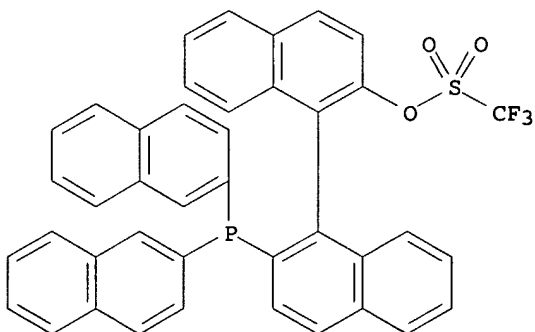
RN 187741-54-4 HCAPLUS

CN Methanesulfonic acid, trifluoro-, (1S)-2'-(di-2-naphthalenylphosphinyl)[1,1'-binaphthalen]-2-yl ester (9CI) (CA INDEX NAME)



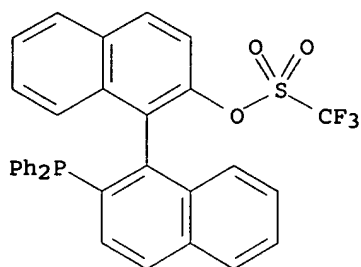
RN 187742-38-7 HCAPLUS

CN Methanesulfonic acid, trifluoro-, (1S)-2'-(di-2-naphthalenylphosphino)[1,1'-binaphthalen]-2-yl ester (9CI) (CA INDEX NAME)

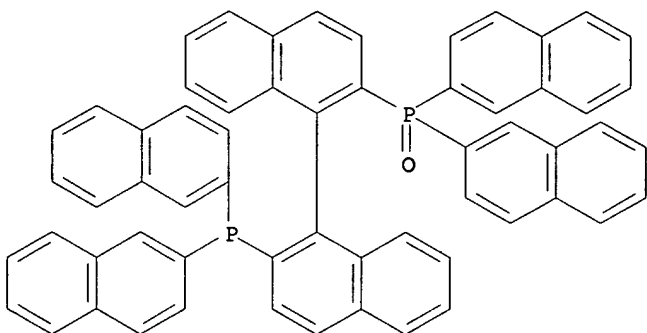


RN 187742-81-0 HCAPLUS

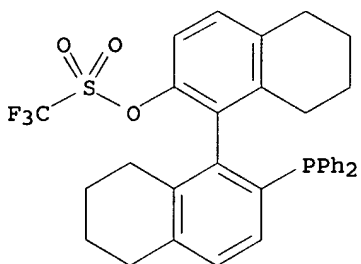
CN Methanesulfonic acid, trifluoro-, (1R)-2'-(diphenylphosphino)[1,1'-binaphthalen]-2-yl (9CI) (CA INDEX NAME)



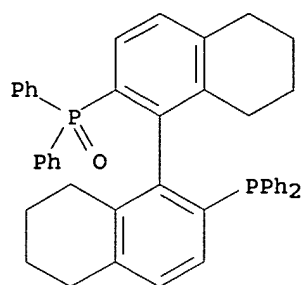
RN 190896-71-0 HCAPLUS  
 CN Phosphine oxide, [(1S)-2'-(di-2-naphthalenylphosphino)[1,1'-binaphthalen]-2-yl]di-2-naphthalenyl- (9CI) (CA INDEX NAME)



RN 207683-39-4 HCAPLUS  
 CN Methanesulfonic acid, trifluoro-, (1R)-2'-(diphenylphosphino)-5,5',6,6',7,7',8,8'-octahydro[1,1'-binaphthalen]-2-yl ester (9CI) (CA INDEX NAME)



RN 207683-40-7 HCAPLUS  
 CN Phosphine oxide, [(1R)-2'-(diphenylphosphino)-5,5',6,6',7,7',8,8'-octahydro[1,1'-binaphthalen]-2-yl]diphenyl- (9CI) (CA INDEX NAME)



IT 76189-55-4P, (R)-2,2'-Bis(diphenylphosphino)-1,1'-binaphthyl

139139-86-9P, (R)-2,2'-Bis(diphenylphosphino)-

5,5',6,6',7,7',8,8'-octahydro-1,1'-binaphthyl 190896-72-1P

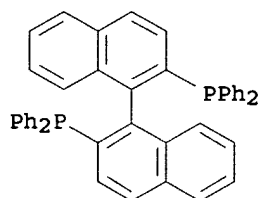
, (S)-2,2'-Bis(bis(2-naphthyl)phosphino)-1,1'-binaphthyl

RL: SPN (Synthetic preparation); PREP (Preparation)

(prepn. of)

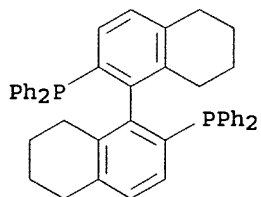
RN 76189-55-4 HCAPLUS

CN Phosphine, (1R)-[1,1'-binaphthalene]-2,2'-diylbis[diphenyl- (9CI)  
(CA INDEX NAME)



RN 139139-86-9 HCAPLUS

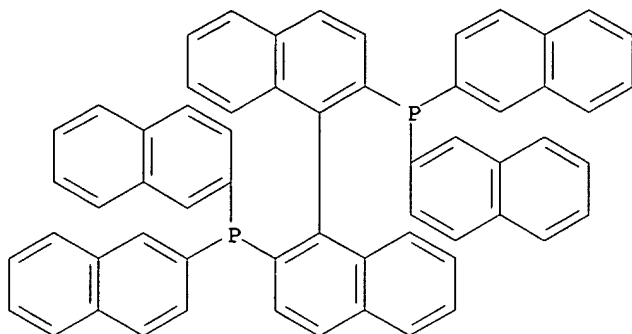
CN Phosphine, [(1R)-5,5',6,6',7,7',8,8'-octahydro[1,1'-binaphthalene]-  
2,2'-diyl]bis[diphenyl- (9CI) (CA INDEX NAME)



RN 190896-72-1 HCAPLUS

CN Phosphine, (1S)-[1,1'-binaphthalene]-2,2'-diylbis[di-2-naphthalenyl-  
(9CI) (CA INDEX NAME)





IC ICM C07F009-50  
ICS C07F009-53  
ICI C07M007-00  
CC 29-7 (Organometallic and Organometalloidal Compounds)  
IT 6737-42-4, 1,3-Bis(diphenylphosphino)propane 7688-25-7,  
1,4-Bis(diphenylphosphino)butane  
RL: CAT (Catalyst use); USES (Uses)  
(catalyst component; for prepn. of optically active  
bis(phosphine))  
IT 14647-23-5, (1,2-Bis(diphenylphosphino)ethane)dichloronickel  
RL: CAT (Catalyst use); USES (Uses)  
(catalyst; for prepn. of optically active bis(phosphine))  
IT 65355-14-8P, (R)-2,2'-Dihydroxy-5,5',6,6',7,7',8,8'-octahydro-1,1'-  
binaphthyl 128544-05-8P, (S)-2,2'-Bis(trifluoromethanesulfonyloxy)-  
1,1'-binaphthyl 132532-04-8P, (R)-2-Diphenylphosphinyl-2'-  
trifluoromethanesulfonyloxy-1,1'-binaphthyl 152646-80-5P,  
(R)-2-Diphenylphosphino-2'-diphenylphosphinyl-1,1'-binaphthyl  
159496-89-6P, (R)-2,2'-Bis(trifluoromethanesulfonyloxy)-  
5,5',6,6',7,7',8,8'-octahydro-1,1'-binaphthyl 159496-90-9P  
, (R)-2-Diphenylphosphinyl-2'-trifluoromethanesulfonyloxy-  
5,5',6,6',7,7',8,8'-octahydro-1,1'-binaphthyl 187741-54-4P  
, (S)-2-(Bis(2-naphthyl)phosphinyl)-2'-trifluoromethanesulfonyloxy-  
1,1'-binaphthyl 187742-38-7P, (S)-2-(Bis(2-  
naphthyl)phosphino)-2'-trifluoromethanesulfonyloxy-1,1'-binaphthyl  
187742-81-0P, (R)-2-Diphenylphosphino-2'-  
trifluoromethanesulfonyloxy-1,1'-binaphthyl 190896-71-0P,  
(S)-2-(Bis(2-naphthyl)phosphino)-2'-(bis(2-naphthyl)phosphinyl)-1,1'-  
binaphthyl 207683-39-4P, (R)-2-Diphenylphosphino-2'-  
trifluoromethanesulfonyloxy-5,5',6,6',7,7',8,8'-octahydro-1,1'-  
binaphthyl 207683-40-7P, (R)-2-Diphenylphosphino-2'-  
diphenylphosphinyl-5,5',6,6',7,7',8,8'-octahydro-1,1'-binaphthyl  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP  
(Preparation); RACT (Reactant or reagent)  
(intermediate for prepn. of optically active bis(phosphine))  
IT 76189-55-4P, (R)-2,2'-Bis(diphenylphosphino)-1,1'-binaphthyl  
139139-86-9P, (R)-2,2'-Bis(diphenylphosphino)-  
5,5',6,6',7,7',8,8'-octahydro-1,1'-binaphthyl 190896-72-1P  
, (S)-2,2'-Bis(bis(2-naphthyl)phosphino)-1,1'-binaphthyl  
207683-41-8P, (S)-2,2'-Bis(trifluoromethanesulfonyloxy)-  
5,5',6,6',7,7',8,8'-octahydro-1,1'-binaphthyl  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. of)

REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR  
THIS RECORD. ALL CITATIONS AVAILABLE IN  
THE RE FORMAT

L26 ANSWER 51 OF 62 HCAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 1998:157615 HCAPLUS  
DOCUMENT NUMBER: 128:270732  
TITLE: Preparation of optically active